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Environmental
Center

Phase 2
Remedial Investigation Report Army Materials Technology Laboratory

Task Order 1
Remedial Investigation/Feasibility Study

Contract Number DAAA15-90-D-0009

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FINAL

Task Order 1

PHASE 2 REMEDIAL INVESTIGATION FOR BASE CLOSURE REMEDIAL INVESTIGATION/FEASIBILITY STUDY ARMY MATERIALS TECHNOLOGY LABORATORY WATERTOWN, MASSACHUSETTS

Contract No. DAAA15-90-D-0009

VOLUME 5

May 1994

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VOLUME 5

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TIMELINES Inc.

HISTORIC PRESERVATION ANALYSIS & PLANNING

December 3, 1993

Rich Shimko
Roy F. Weston, Inc.
One Weston Way
West Chester, PA 19380-1499

RE: Watertown Arsenal
Watertown, Massachusetts

Dear Mr. Shimko:

Thank you for the opportunity to respond to the comments received concerning our analysis of the archaeological potential of AMTL Watertown, MA. These letters address two major issues: first, the accuracy of our assessment of a portion of the project area tested with boring 02SB-4 (TL 6) and second, an assessment of the "area east of Building 43" with recommendations for additional testing in advance of planned new construction.

1. Boring 02SB-4 (TL 6)

While the boring profile presented in Appendix B of the report identifies "natural" soil beneath 2.6 feet of fill, a closer examination will reveal that this "natural" soil is described as "coarse silty sand with pebbles," which is Timelines' description of the C Horizon (or possibly the interface between B and C) . This is consistent with our identification of hypothetical core 1 of Figure 15 as having low potential, which is in turn consistent with our map of archaeological potential as presented in Figure 17. We believe that Figure 17 reflects as accurately as possible the archaeological potential of the project area. Since this assessment was derived from the analysis of 2.5-in. cores taken throughout the project area, the boundaries between zones of potential cannot be considered exact but can be used for making resource-management decisions in the face of planned land disturbance when taken with the other analysis approaches presented in the report.

2. Area of planned development east of Building 43.

The area east of Building 43 is the far northeast corner of the project area near the Main Gate. Analysis of this area is driven by borings GRSB-10 (TL 50), 03SB-2 (TL 8) and 03SB-1 (TL 11).

- GRSB-10 (TL 50) - Examination of this profile indicates that no fill overlies the remaining soil horizon, therefore, whatever the archaeological potential of this horizon, it is highly vulnerable. Further examination, however, indicates that the first horizon encountered in the boring is described as "sandy soil, some small gravel,"which is our definition of the low-potential C horizon. (This is consistent with the small low-potential node in the northwest corner of Figure 17).

- 03SB-2 (TL 8) - This boring, taken from within Building 43, reveals 16.5 ft. of fill over "sand" (our B horizon), followed by "clayey sand"(our subsoil). It is not unusual to have soil profiles with one or more horizons missing (in this case, the C horizon), and we have taken the conservative approach by identifying the "sand" as the B horizon. The existence of a B horizon is consistent with our identification of medium potential (Figure 15), which is in turn consistent with Figure 17.

- 03SB-1 (TL 11) - This boring was in reality the drilling of a monitor well and as such was not monitored as closely as the test borings. The log in Appendix B indicates that the first description is at five feet and is "sand with gravel and small stones underlain by "brown silt and some gravel." This latter may be an A horizon, but its great depth (10 ft.) makes this supposition doubtful. We have thus assigned a low potential to this point. Its mathematical weight, however, was not enough to change this area to "low" from its more conservative "medium" rating.

For the area east of Building 43, therefore, it appears that the fill grades from 16.5 ft. to 0.0 feet. A zone of medium potential with little or no fill for protection is next to the most vulnerable area of the study area as illustrated in Figure 19. The low-potential node with no fill for protection is slightly less vulnerable, but still may contain remains of resources (especially deep Historic period features). It should be remembered, as stated in the report, that **low potential does not mean NO resource potential.** Using Figure 19 as a guide to resource-management decisions (Figure 17 is only one part of the equation), it appears that archaeological resources in the area east of Building 43 have a medium potential for being encountered, even with little ground-disturbing activity. Therefore, it would seem appropriate to recommend a more detailed subsurface examination to locate and evaluate the significance of these resources prior to their disturbance through development construction. This additional work will be important in refining the analysis of the Timelines report.

This further examination illustrates a confusion on the part of reviewers as to how to use this report effectively in resource-management decisions. The main tool for evaluation is the vulnerability index in Figure 19 and Table 4 and is a direct result of developing sensitivity models from the boring data. Using these tools, decisions for further, more detailed

assessments at specific locations can be made. To assist in this assessment, we are providing a revised page 21 of the report, which clearly identifies the characteristics necessary to trigger additional subsurface analysis.

We hope that the above discussion has met your needs. Should you have any other questions or comments, we stand ready to address them.

Sincerely,

Michael E. Roberts
President

MER/eab
Encl.

cc: Brona Simon, Massachusetts Historical Commission
Kate Atwood, United States Army Corps of Engineers
Samuel Gilfix, United States Army
Salvatore Torrisi, United States Army Environmental Center
Elena Décima, Timelines, Inc.

ANALYSIS OF ARCHAEOLOGICAL POTENTIAL

from

SOIL BORINGS

at the

ARMY MATERIALS TECHNOLOGY LABORATORY

Watertown, Massachusetts

By

Michael Roberts

Submitted to

Roy F. Weston, Inc.
1 Weston Way
West Chester, PA 19380-1449

February 25, 1992

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I. INTRODUCTION

This report builds on previous cultural-resource work at the Army Material Testing Laboratory (AMTL) in order more accurately to define the areas within the Laboratory that may contain subsurface remains of historic or prehistoric resources. The three most relevant studies to this effort to date are the Public Archaeology Laboratory (PAL) report (Historic and Prehistoric Reconnaissance Survey, Army Materials Technology Laboratory, Watertown MA [Fitch 1989]), the Envirosphere overview (Archaeological Overviews and Management Man (sic) for the Army Materials and Mechanics Research Center [Klein, et al. 1984]) referred to throughout the PAL report, and the report of the Harvard Institute for Conservation Archaeology's Data Recovery project at the Amphitheater Site just outside the current site limits (The Amphitheater Site: A Late Archaic Settlement in Watertown Massachusetts [Barfield & Barber 1982]).

AMTL is immediately adjacent to the Charles River in Watertown Massachusetts. Figure 1 illustrates its location, while Figure 2 is a more detailed map of the project area. Figure 3 illustrates the surface topography defining a slight downward slope toward the Charles River. This slope, over the years has been filled to level it for more efficient use.

The analysis described in this report confirms much of PAL's earlier work while filling in the gaps identified by PAL and providing data relative to actual disturbance that was only speculated upon in the earlier work.

The results of this reports' analysis include a map of expected zones of archaeological resource potential, a map of depth of fill over these various zones and the identification of those areas within the AMTL where potentially significant archaeological resources are vulnerable to various levels of future ground disturbance.

The current study evaluates 63 two-and-a-half-inch split-spoon cores (extracted in the course of Phase II field investigations) with the intention of identifying areas within the site that have a potential for containing archaeological resources. Some cores were identical with a set of borings establishing a grid of 300 ft. throughout the site (Fig. 4). Others were cores taken in accordance with Weston's plan for pinpointing potential soil contamination locations identified through background studies (Fig. 5). Figure 6 identifies the locations of all cores.

The coring operation was conducted in accordance with OSHA'S guidelines for hazardous-waste site evaluation and required Level C personal protection for some of the locations within the various buildings that may have contained hazardous materials. All direct participants, including the archaeological team, had been certified for work at such locations through the successful completion of the OSHA 40-hour hazardous-waste-site workers' instruction course.

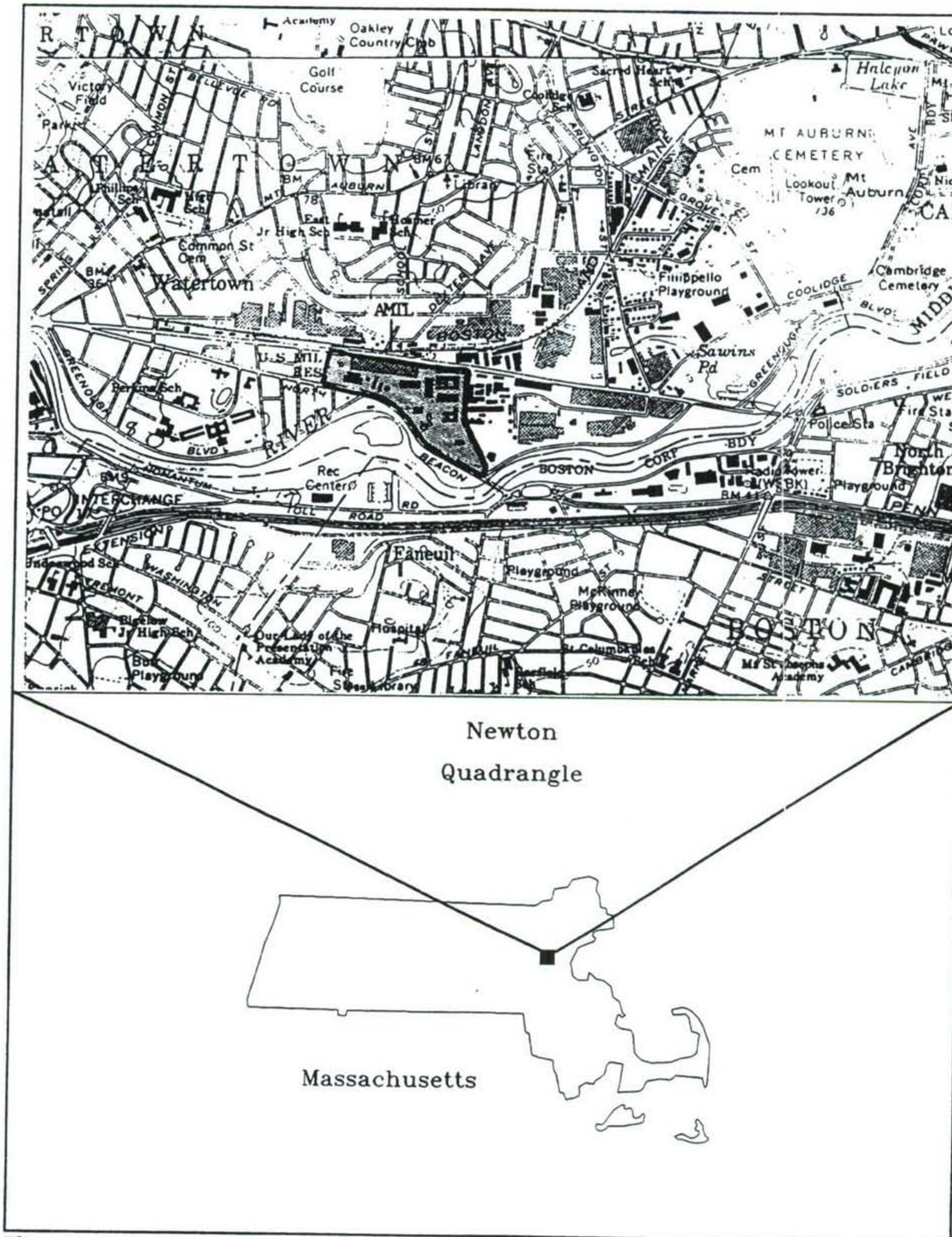


Figure 1 - Project location.

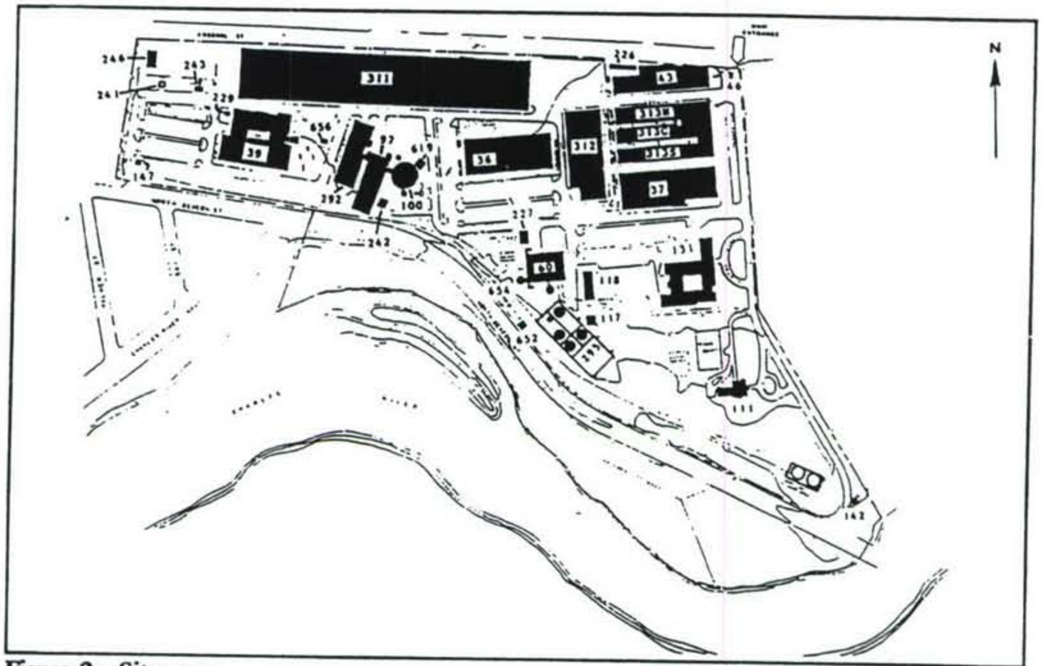


Figure 2 - Site map.

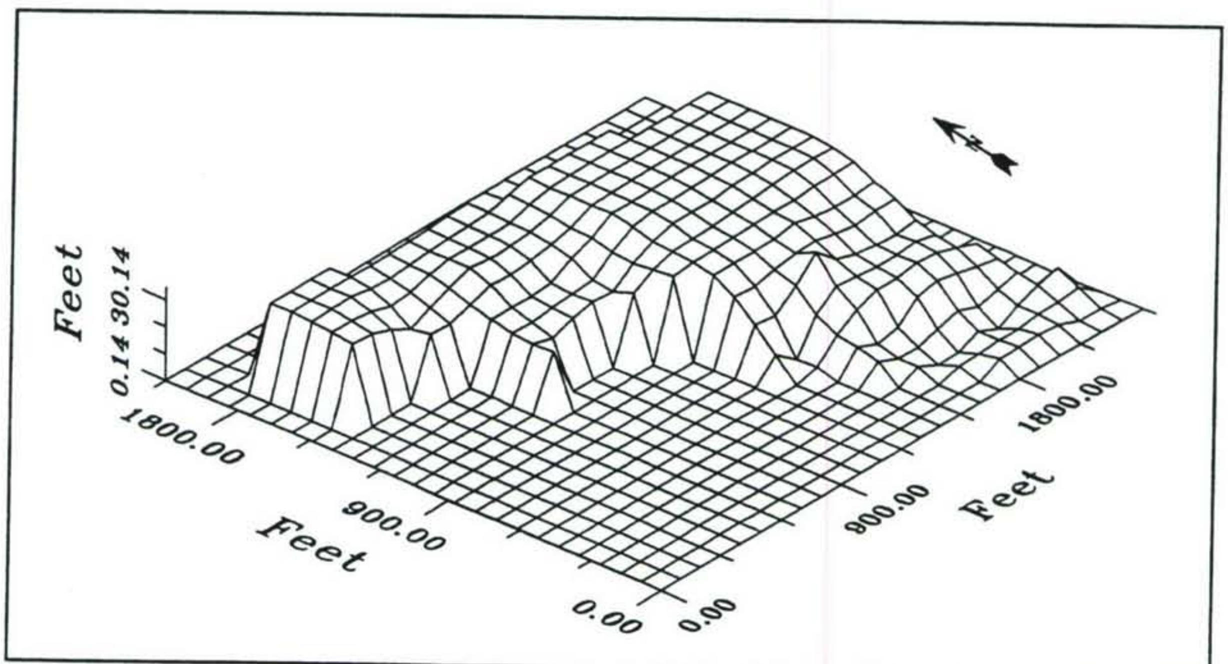


Figure 3 - Surface topography.

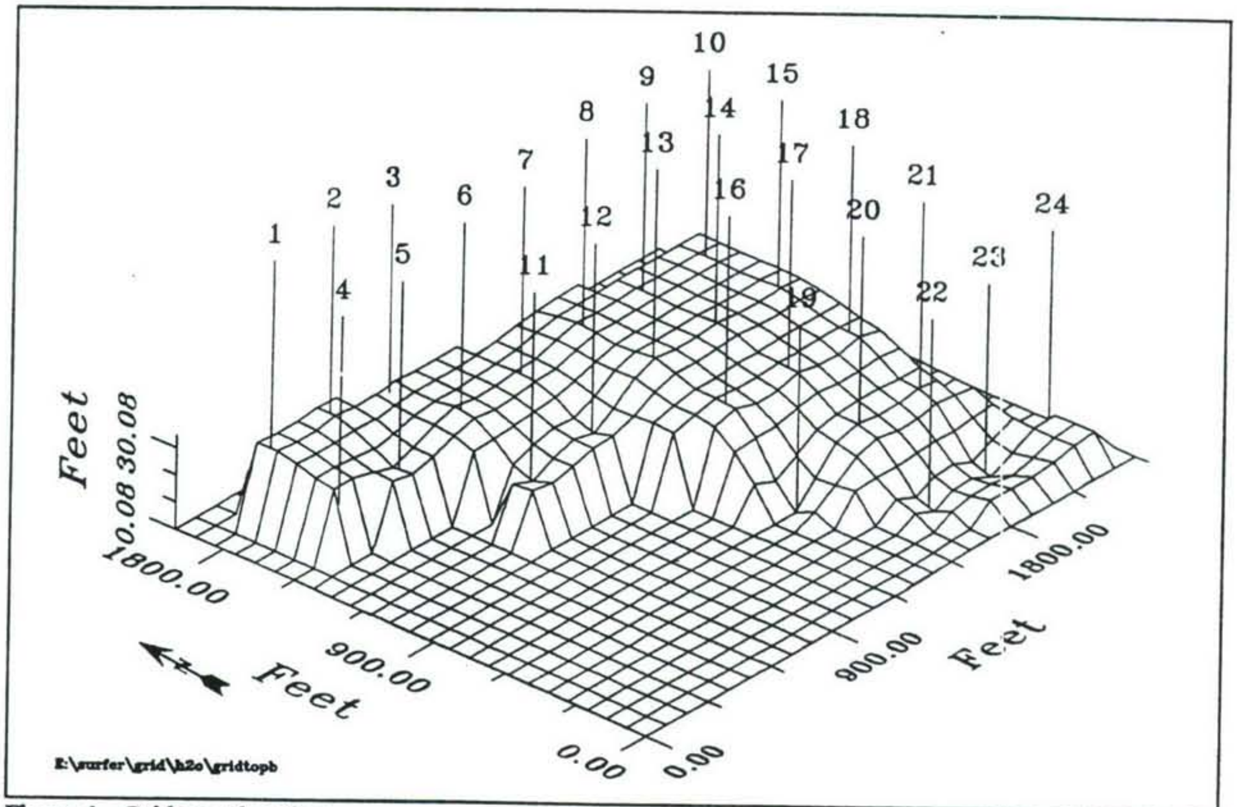


Figure 4 - Grid core locations.

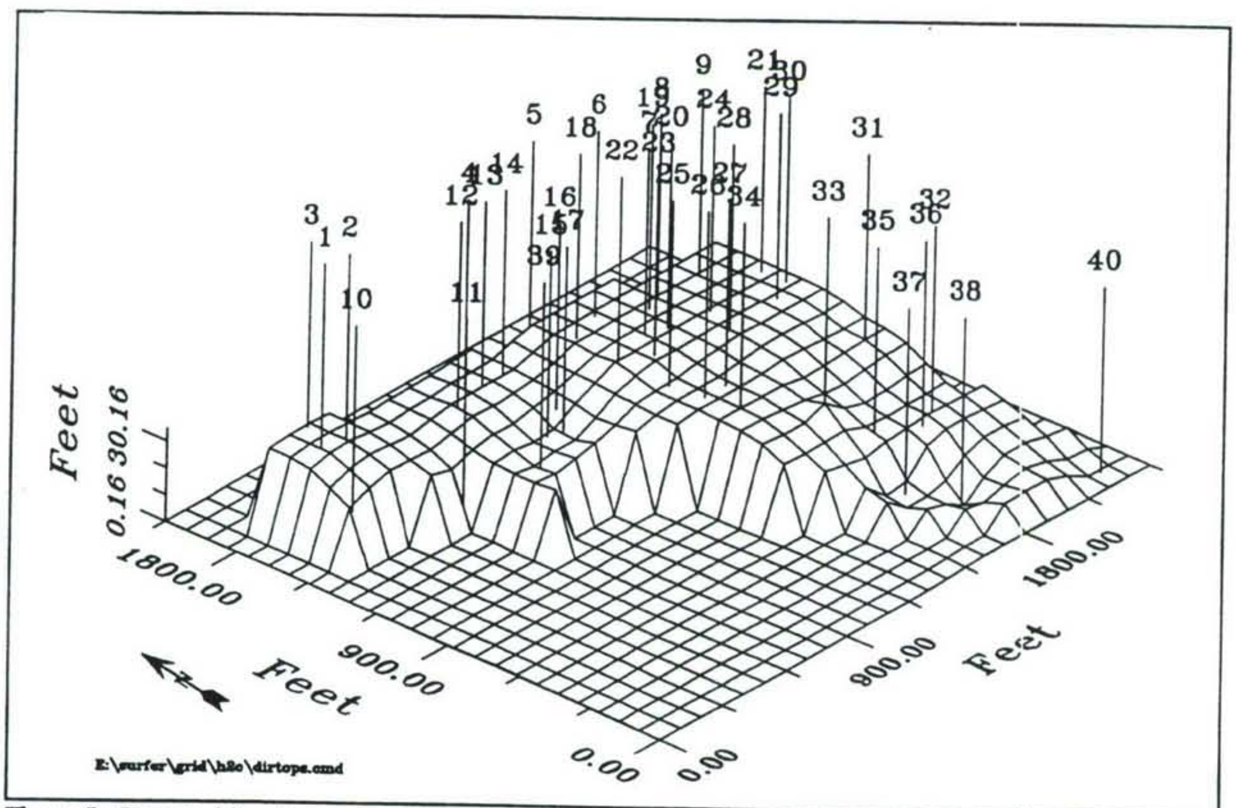


Figure 5 - Targeted locations.

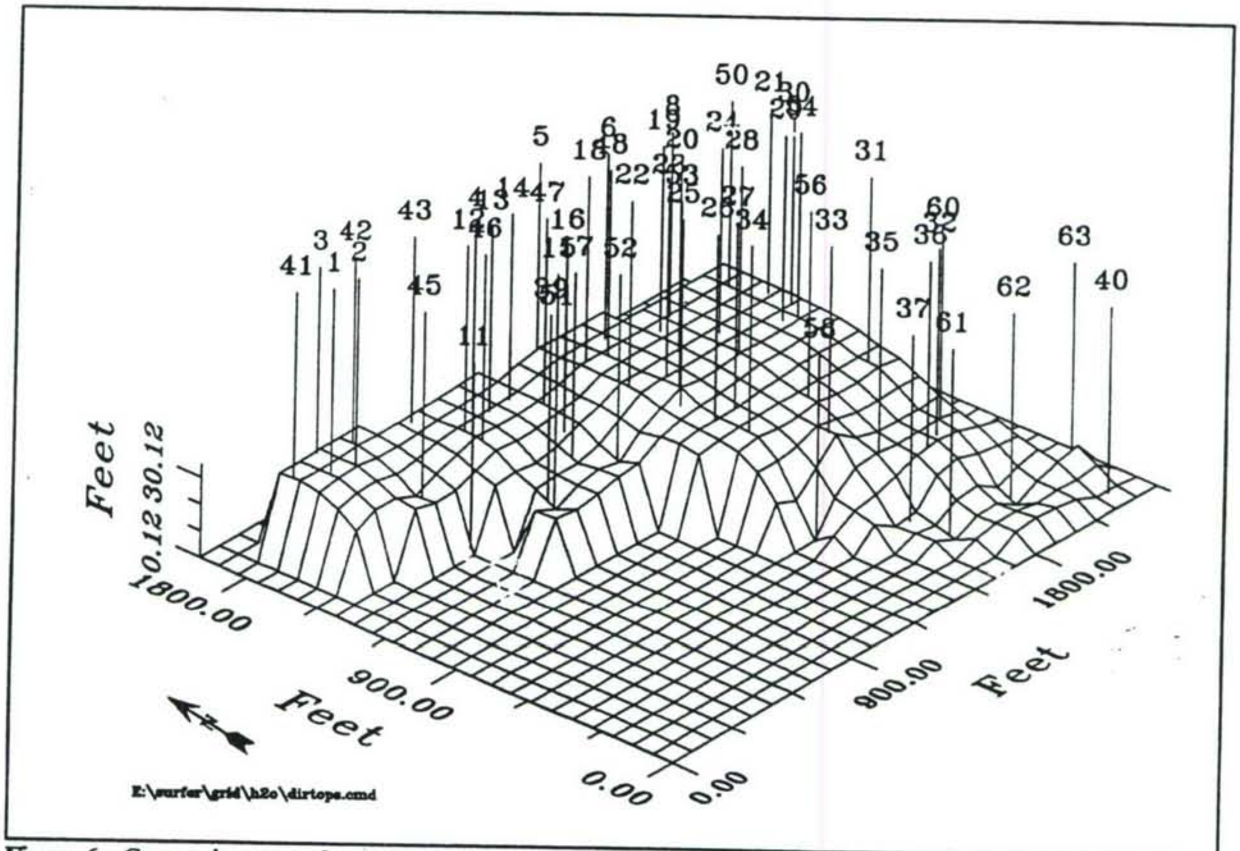


Figure 6 - Composite map of core locations.

II. PREVIOUS STUDIES

The PAL study (Fitch 1989) comprised an exhaustive search of documentary evidence to locate zones of possible prehistoric activity, to confirm the locations of historic-period features within the project area as closely as possible, and to assess the disturbances that may have compromised the integrity of these archaeological resources. Figure 7 illustrates the location of the officially recorded prehistoric site 19-MD-323 described in Table 1; Figure 8 illustrates PAL's determination of prehistoric site potential.

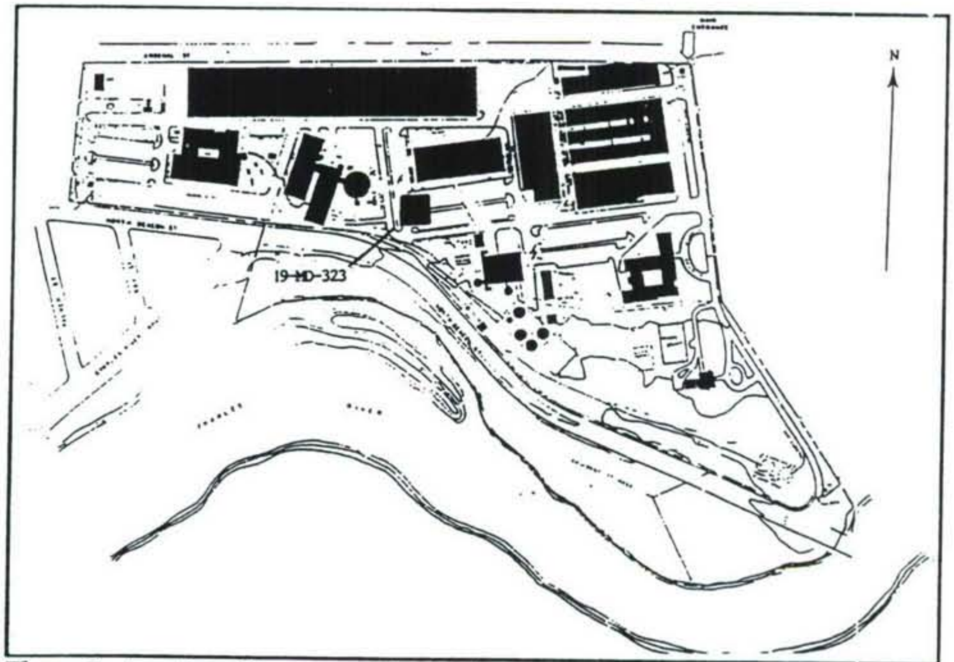


Figure 7 - Location of known prehistoric site.

Table 1 - Known Prehistoric Archaeological Sites at the AMTL Facility

Location	Site No.	Site Name	Cultural Temporal Affiliation	Reference
West end, near old Powder Magazine	19-MD-373	Powder Magazine	Late Archaic-Watertown Phase	Guernsey and Frazer Collection 1880-1910 Dincauze 1968 (MHC files)

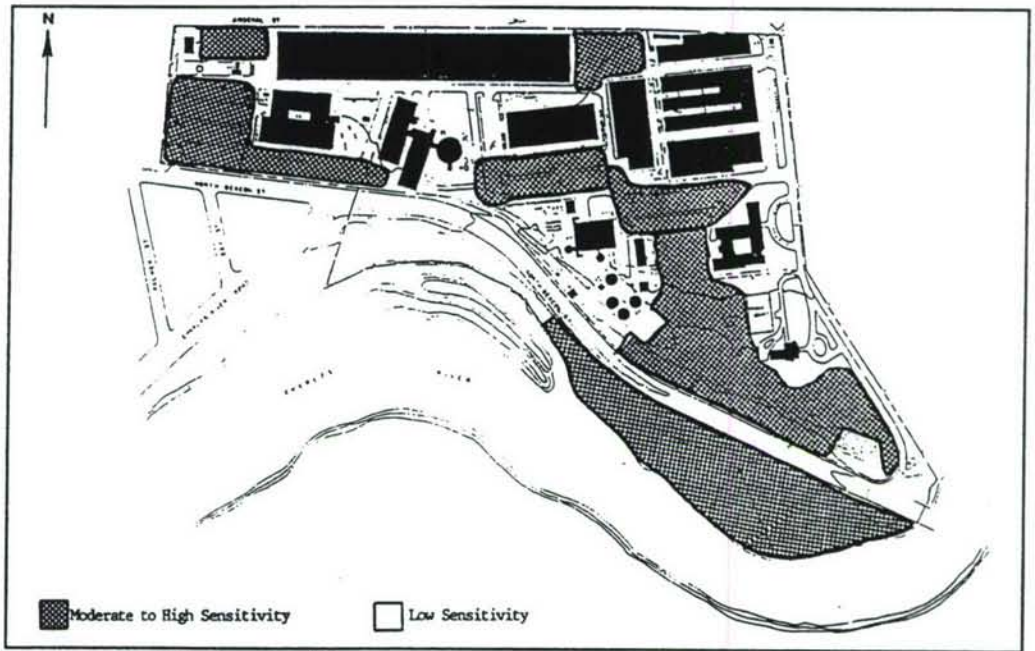


Figure 8 - Prehistoric potential.

Table 2 (originally from Klein et al. 1984) describes the potential non-military and arsenal-related historic archaeological resources at the AMTL, while Figure 9 locates the sites and Figure 10 establishes PAL's assessment of historic archaeological potential.

Using the data from documentary sources as well as a knowledge of disturbance levels from various historic activities, PAL assigned the designation"disturbed" to the entire AMTL. Data gaps identified by PAL which called for a more accurate assessment include the need for subsurface examination to evaluate the nature and distribution of land-moving and land-filling activities, as well as additional research to aid in the assessment of disturbance from landscaping and other sources. The Phase II field investigation has offered an invaluable opportunity to obtain these additional data. As PAL points out:

> This [subsurface] investigation would be critical to an evaluation of the physical integrity of any potential prehistoric resources. (Fitch 1989:88)
>
> and,
>
> Preliminary sub-surface testing of each potential (historic) site location would determine the presence or absence of intact structural remains associated with each site. (Fitch 1989:94)

Table 2 - Potential Non-Military and Arsenal-Related Historic Archaeological Resources at the AMTL Facility (Source: Klein et al. 1084)

Site No.	Description	Occupant	Reference
Bird-1	Dwelling	G. A. Sawyer	Beers 1875
Bird-2	Dwelling/Outbuilding	–	Beers 1875
Bird-3	Dwelling	G. A. Sawyer	Beers 1875
Lacker-1	Dwelling	D. Condon	Beers 1875
Lacker-2	Outbuilding	–	Dobbs 1977
Lacker-3	Outbuilding	–	Dobbs 1977
Lacker-4	Dwelling	–	Arsenal Plan 1942
Quirk-1	Dwelling	Mrs. A. Cushman	Beers 1875
Quirk-2	Outbuilding	Mrs. A. Cushman	Beers 1875
Simmons-1	Dwelling	–	Beers 1875 Arsenal Plan 1923
Simmons-2	Store	–	Arsenal Plan 1923
Simmons-3	Outbuilding-Barn	–	Beers 1875 Arsenal Plan 1923
Simmons-4	Dwelling	–	Arsenal Plan 1923
1	Dwelling	Arsenal	Dobbs 1977
2	Building 214 (site of 1842 Laboratory)	Arsenal	Dobbs 1977
3	Building 123 (site of pre-1862 NCO quarters)	Arsenal	Dobbs 1977
4	Building 45 (1915 Press Shop)	Arsenal	Dobbs 1977
5	Building 216 (1886 Winding Shed)	Arsenal	Dobbs 1977
6	Bulding 922 (Foundry Shed)	Arsenal	Dobbs 1977
7	Building 921 (1917-1919 Garage)	Arsenal	Dobbs 1977
8	Building 913 (manure shed and pit)	Arsenal	Arsenal Plans 1919, 1921
9	Building 96 (set of track scales)	Arsenal	Arsenal Plan 1921
10	Building 145 (guard house)	Arsenal	Arsenal Plan 1956
11	Site of Tennis Courts, Gas Pump and Tanks	Arsenal	Arsenal Plan 1918, 1919
12	Site of Wagon Shed	Arsenal	Arsenal Plan 1918, 1919
13	Site of Shed	Arsenal	Arsenal Plan 1918, 1919
14	Site of Two Pottery Sheds	Arsenal	Arsenal Plan 1918, 1919
15	Site of Oil Storage	Arsenal	Arsenal Plan 1918, 1919

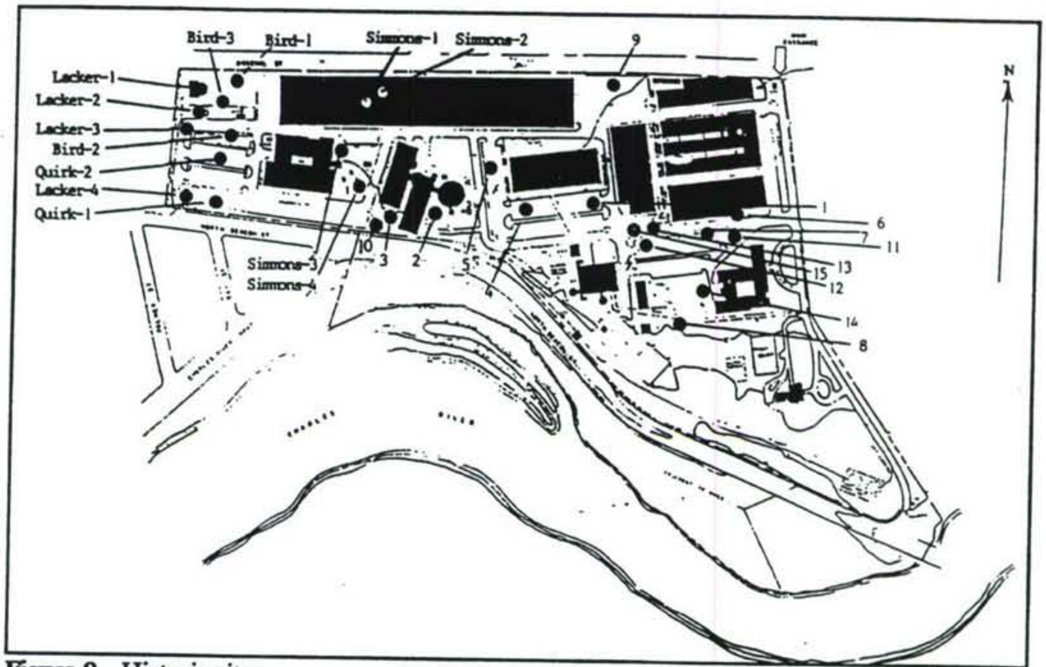


Figure 9 - Historic sites.

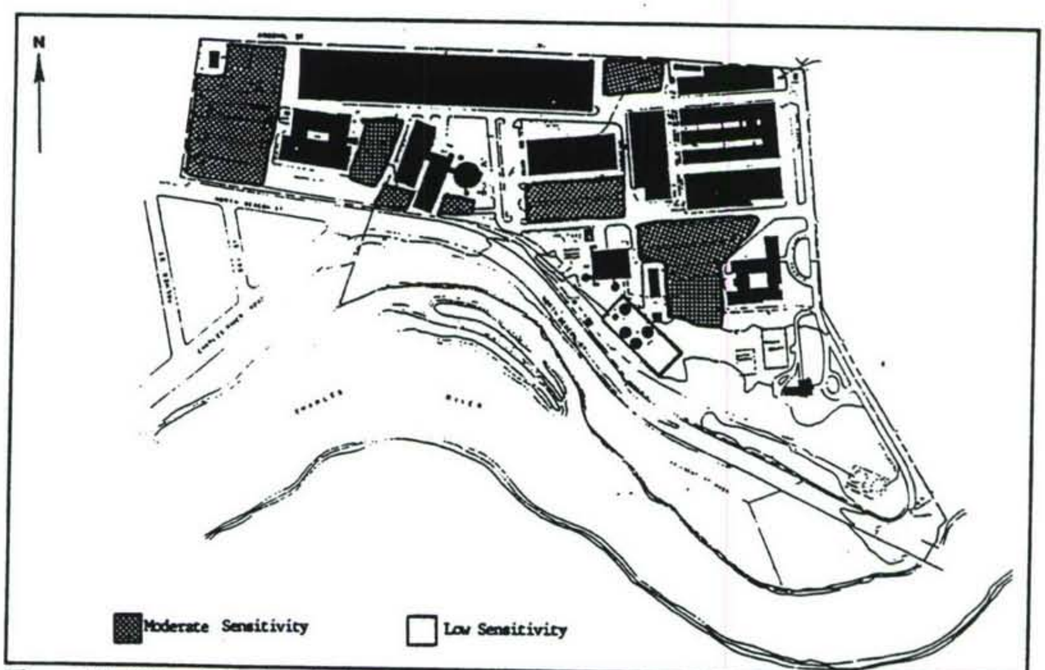


Figure 10 - Historic archaeological potential.

The ICA report provides two sets of data relevant to the current analysis. The first is the confirmation of the current existence of a prehistoric site (the amphitheater site) in a setting identical to that found within the current study area (as well as adjacent to it) and establishes the nature of the soil stratigraphy associated with a prehistoric site in this location.

> --the Arsenal's location on a sandy, well drained terrace overlooking the Charles River estuary was a preferred occupation area during the prehistoric period. (Fitch 1989:85)

Figure 11 illustrates the stratigraphy of the Amphitheater Site along a north-south face of excavation area C (Fig. 12), which is at the 25-to-24-ft. contour level (Fig. 13). For our purposes in the current analysis, we will use this profile as the standard for the describing recovered cores. In Figure 11 strata 1,2 and 3 represent the A horizon, 4 and 5 the B horizon, and 6 and 7 the C horizon. For a more detailed discussion of the soil stratigraphy, see Section III, Methodology, in this report.

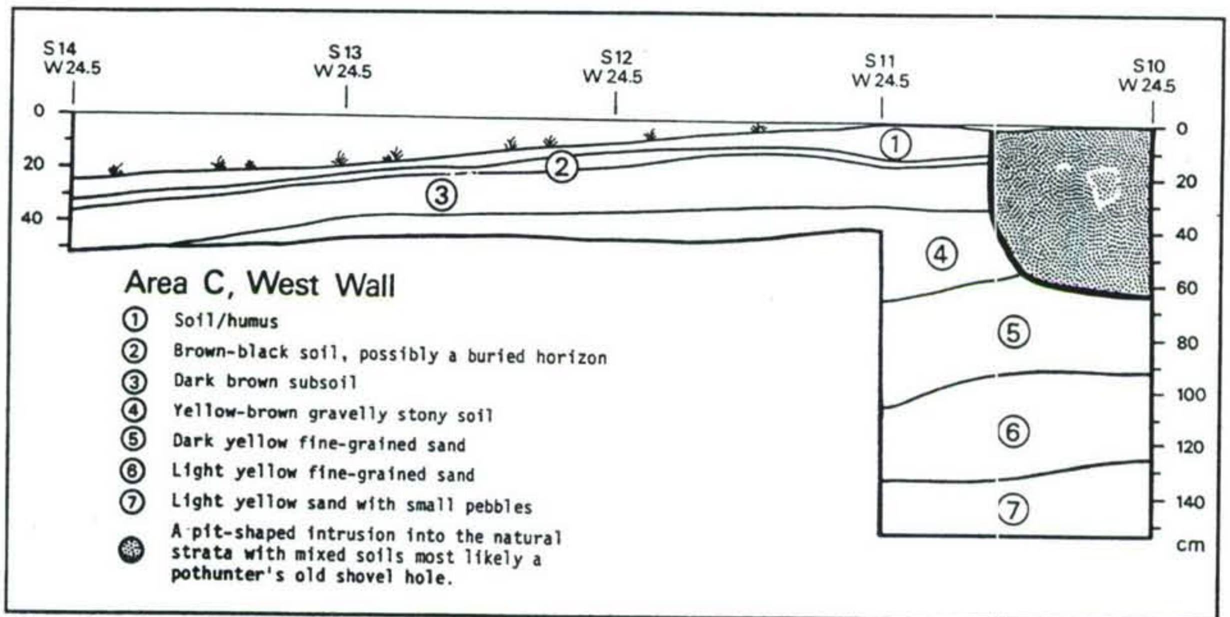


Figure 11 - Area C, west wall of amphitheater.

As pointed out above, it is critical to the analysis to establish the "normal" soil profile accurately, since

> the major restraint to prehistoric archaeological resource potential is the disturbance of natural topsoils and some subsoils that would have contained the prehistoric depositions (Fitch 1989:88).

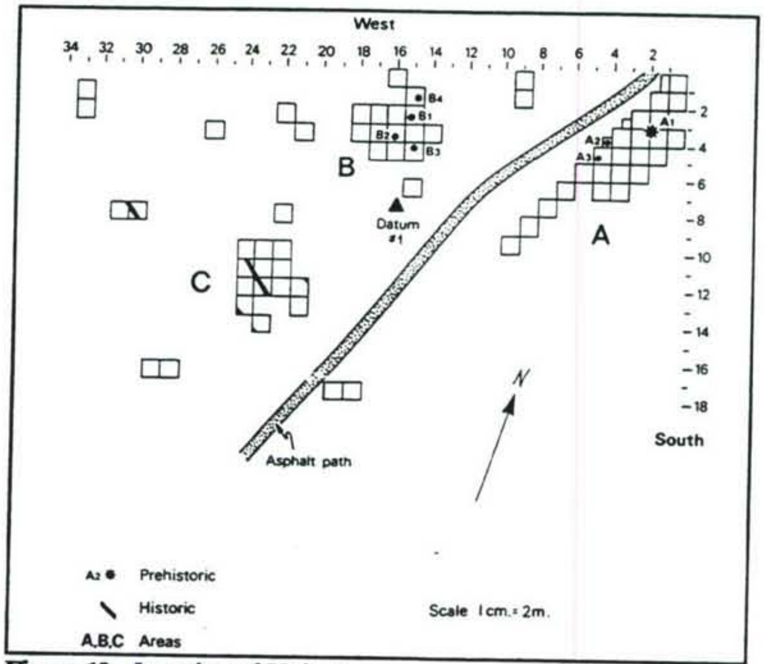


Figure 12 - Location of Unit C.

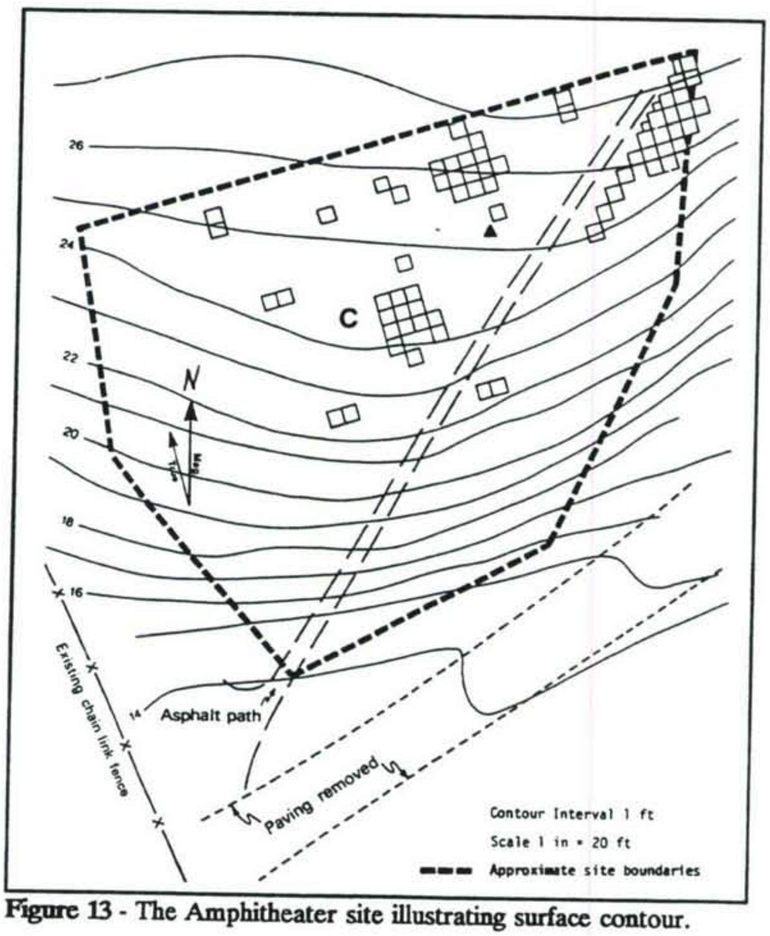


Figure 13 - The Amphitheater site illustrating surface contour.

III. METHODOLOGY

A. Core Monitoring

Each one of the 63 cores extracted for the Phase II field investigation was monitored by an archaeologist trained in the identification of glacial soils. Upon extraction, both the archaeologist and the Weston geologist independently identified soil color (via comparison to a Munsell standardized color chart), silt/clay ratios and fraction of gravel. These data, as well as other observations, were recorded on standardized forms designed for this purpose. Appendix A contains the forms completed by Timelines, while the Weston forms are in Appendix B. From time to time, artifacts were recovered from the cores. These were cleaned and catalogued on Timelines' Computer-Cataloguing System. Appendix C is the artifact catalogue. The archaeologists maintained field notes, which are retained at the offices of Timelines and are available for inspection.

B. Establishing "Normal" Stratigraphy

In order to assess the integrity of the recovered soil profile, it was necessary to establish a so-called "normal" profile by which all others would be evaluated. Using the profile of the west wall of area C of the Amphitheater Site excavations, we searched the recovered cores for similar stratigraphy. Weston core no. 02SB-3 (Timelines no. 5) exhibited the closest fit. This core came from under the floor of Building 311 (1917); there was no evidence of previous disturbance from the core or from the background research. Figure 14 relates the stratigraphy of core no. 5 to standard descriptions of soil horizons commonly used in New England archaeology, which are described thus by Limbrey (1975):

> Mixed Mineral and Organic Horizons - A
> The mixture of mineral and organic material produced by earthworm activity is known as mull humus. Humification is rapid and tales place within the soil rather than at its surface and the humus substances are in intimate association with clay minerals and calcium. (Limbrey 1975:78)
>
> Horizons of Accumulation - B
> These are subsurface horizons where an absolute or relative accumulation of products of mineral alteration or of humus substances has developed as a result of alteration in situ or as a result of translocation from overlying horizons. (Limbrey 1975:79)
>
> C Horizon
> The C horizon is the lowest part of the profile, the rock undergoing alteration under the influence of moisture percolating from the soil above and deeper roots of plants, which has not reached the stage at which rock structure is obliterated. (Limbrey 1975:81)

This last definition must be modified for southern New England by the notation that the C horizon can be underlain by glacial till or clay deposits resulting from outwash sedimentation.

C. Defining Fill

With all the core logs in hand, we refined our definition of "fill" to include only those soils that contained brick, ash, artifacts, or other clearly identifiable items of human manufacture. This was done when it was clear that in some cases the archaeologists and geologists disagreed in their identification of a fill horizon and the archaeologists sometimes revised their definitions over the course of the core monitoring.

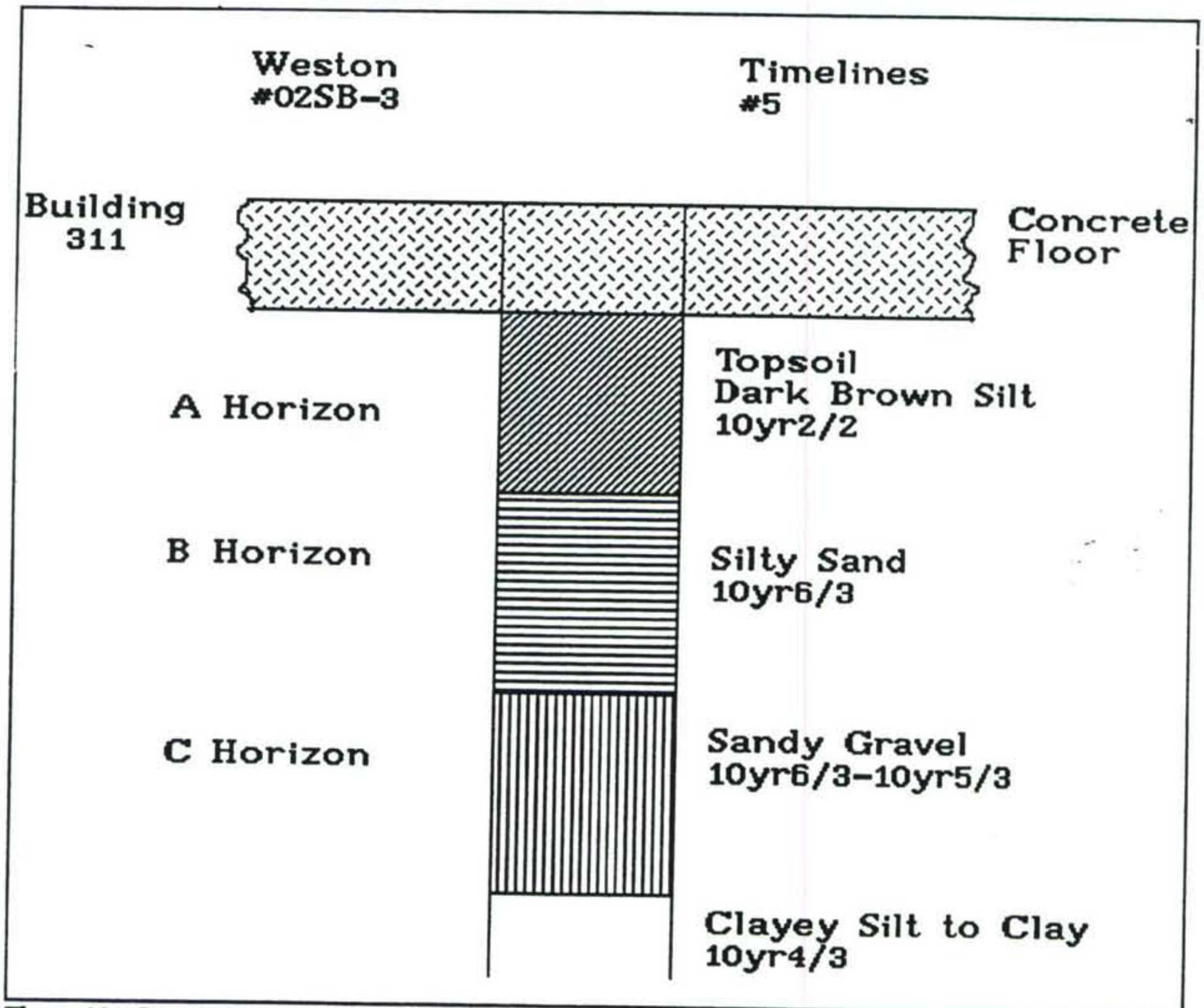


Figure 14 - Core 025B-3 (Timelines No. 5).

D. Establishing Archaeological Potential

Figure 15 illustrates the model used for the establishment of archaeological potential. Core 1 has the A and B horizons completely obliterated and thus has a low potential for containing prehistoric resources and may only contain truncated remains of historic-period features such as wells and privies. Core 2 has the A horizon removed but some of the B horizon remains intact. Thus there is a moderate possibility for the existence of intact prehistoric and historic resources. Cores 3, 4 and 5 illustrate three cores that have a high potential for containing intact prehistoric and historic resources. Core 3 has a truncated A horizon but all other elements of this core remain intact. Core 4 has all "normal" soil horizons intact but has been covered by fill. This situation has protected prehistoric and historic resources, should they exist. The final core, no. 5, illustrates the "normal" stratigraphy, which could also contain intact prehistoric and historic resources.

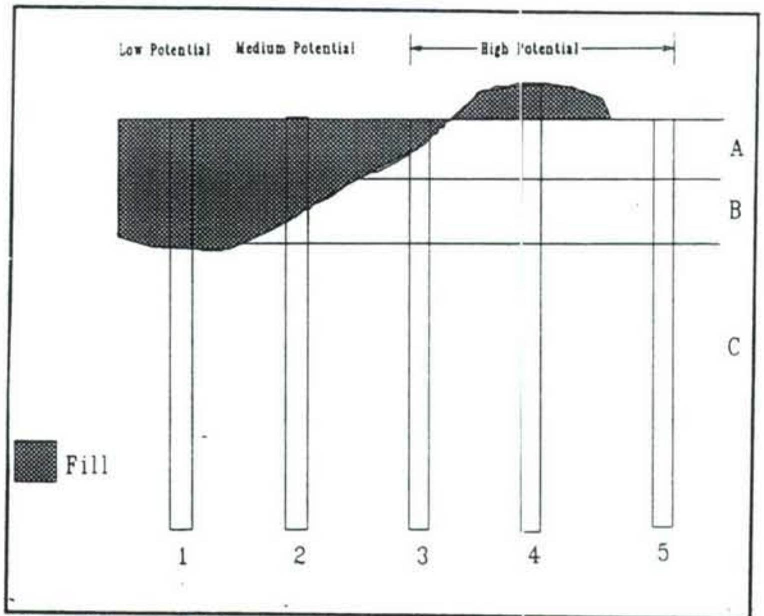


Figure 15 - Establishment of archaeological potential.

E. Analysis

Each core log was examined and assigned one of three levels of archaeological potential.

Level 1 = High Potential (Fig. 15, no.3, no.4, and no.5).
Level 2 = Medium Potential (Fig. 15, no.2)
Level 3 = Low Potential (Fig. 15, no.1)

The X and Y position of each core on a preestablished grid pattern was documented, and the surface contour noted. Finally, if fill was present, the depth of fill to the natural stratigraphy was recorded. This information was entered into the surface-mapping Surfer computer program to establish the distribution of the various zones of potential over the project area. In addition, the depth of fill across the site was mapped. For all Surfer maps, the inverse distance gridding process was used with a 25 X 25 grid.

IV. RESULTS

A. Archaeological Potential

Figure 16 illustrates the location of all the cores used in the analysis of archaeological potential. Table 3 shows the results of the analysis of each of the 63 cores and is what was used in the Surfer program to map the zones of potential and depth of fill.

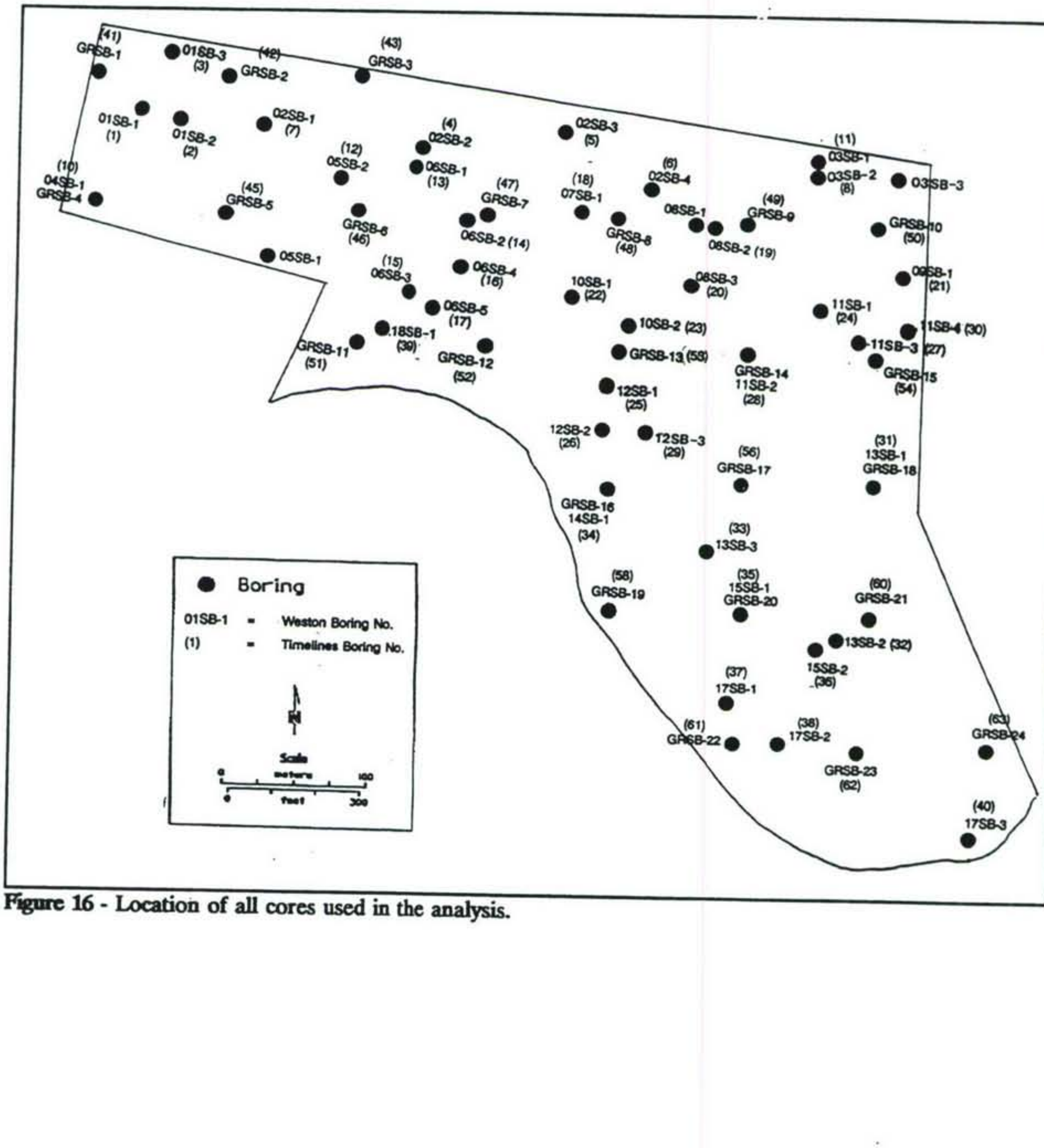


Figure 16 - Location of all cores used in the analysis.

Table 3 - Data Used in Mapping

Analysis Results						
Timelines Boring Number	Weston Boring Number	X Position	Y Position	Surface Contour in Feet	Arch. Potential	Fill Depth from Surface
1	01SB-1	300	1700	30	Medium	-8.0
2	01SB-2	400	1675	30	High	-1.3
3	01SB-3	375	1825	30	Low	-3.7
4	02SB-2	925	1625	30	Medium	-2
5	02SB-3	1300	1675	35	High	0
6	02SB-4	1475	1550	35	Low	-2.6
7	02SB-1	NO CORE TAKEN				
8	03SB-2	1850	1600	35	Medium	-7
10	04SB-1	NO CORE TAKEN				
11	03SB-1	600	1350	20	Low	0
12	05SB-2	800	1550	30	Low	-2.7
13	06SB-1	950	1575	30	Low	0
14	06SB-2	1050	1575	30	Medium	-3
15	06SB-3	950	1300	20	Medium	-8.6
16	06SB-4	1050	1350	30	Low	-10
17	06SB-5	1000	1275	20	Low	-10
18	07SB-1	1325	1500	35	Medium	0
19	08SB-2	1630	1450	35	Low	-2
20	08SB-3	1575	1325	35	Low	-3
21	09SB-1	2050	1350	35	High	0
22	10SB-1	1300	1300	35	Medium	-5.2
23	10SB-2	1425	1250	35	High	-2.3
24	11SB-1	1750	1300	35	High	-3
25	12SB-1	1350	1125	30	High	-4.8
26	12SB-2	1375	1000	30	High	-5
27	12SB-3	1475	1000	30	Medium	-6
28	11SB-2	1700	1175	35	High	-2.5
29	11SB-3	1950	1200	35	Medium	-1
30	11SB-4	2050	1250	35	High	0

Analysis Results (Continued)						
Timelines Boring Number	Weston Boring Number	X Position	Y Position	Surface Contour in Feet	Arch. Potential	Fill Depth from Surface
31	13SB-1	2000	875	30	Low	-1
32	13SB-2	1925	525	20	High	0
33	13SB-3	1600	700	30	High	0
34	14SB-1	1400	875	30	High	-4.6
35	15SB-1	1700	575	20	Medium	-2.7
36	15SB-2	1850	500	20	High	-2
37	17SB-1	1650	400	0	High	-2.6
38	17SB-2	1800	275	0	High	-6.6
39	18SB-1	800	1200	20	Medium	-10.8
40	17SB-3	2250	75	0	Low	-8
41	GRSB-1	200	1775	30	Medium	0
42	GRSB-2	500	1775	30	High	0
43	GRSB-3	800	1775	30	Low	-4
45	GRSB-5	500	1475	20	Kiw	-8.2
46	GRSB-6	800	1475	30	Medium	0
47	GRSB-7	1100	1475	30	High	-2
48	GRSB-8	1400	1475	35	Low	0
49	GRSB-9	UTILITY TUNNEL				
50	GRSB-10	2000	1475	35	Low	0
51	GRSB-11	800	1175	15	High	0
52	GRSB-12	1100	1175	20	Low	0
53	GRSB-13	1400	1175	35	Low	-7.3
54	GRSB-15	2000	1175	35	High	0
56	GRSB-17	1700	875	30	High	0
58	GRSB-19	1400	575	0	High	-3
60	GRSB-21	2000	575	20	High	-2
61	GRSB-22	1700	275	0	Low	-5
62	GRSB-23	2000	275	0	Low	-5.4
63	GRSB-24	2300	275	10	Medium	-3.6

Figure 17 maps the zones of archaeological potential resulting from the analysis of the recovered cores.

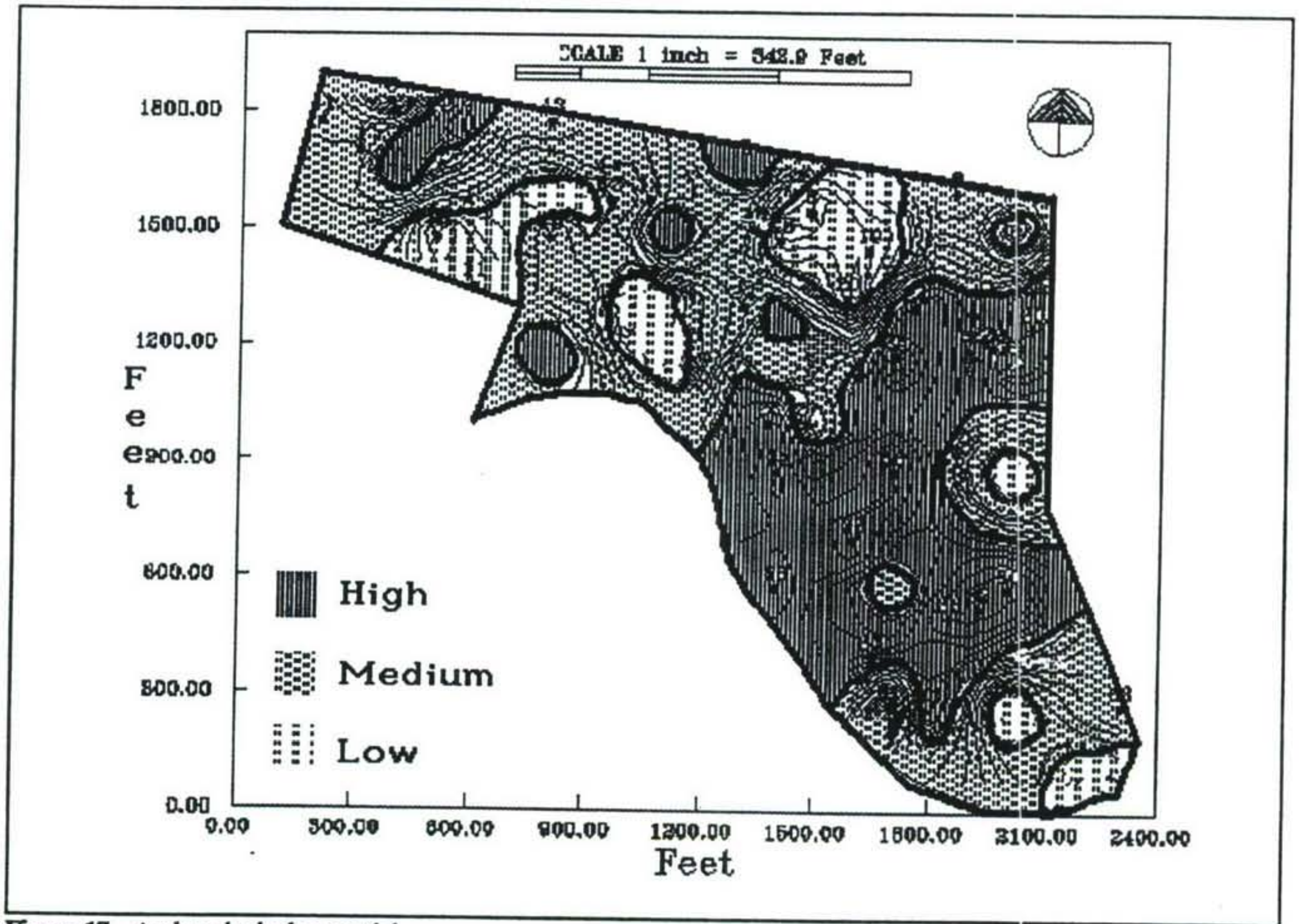


Figure 17 - Archaeological potential.

B. Site Vulnerability

Figure 18 illustrates the depth of fill across the project area. The integration of fill depth and archaeological potential provides an index of how vulnerable existing archaeological resources may be. For this analysis the most vulnerable areas are those that have little if any fill protection over zones of high potential, while the least vulnerable are zones of low potential covered by four or more feet of fill. Table 4 illustrates the stratification of vulnerability. Figure 19 illustrates the vulnerability index across the project area.

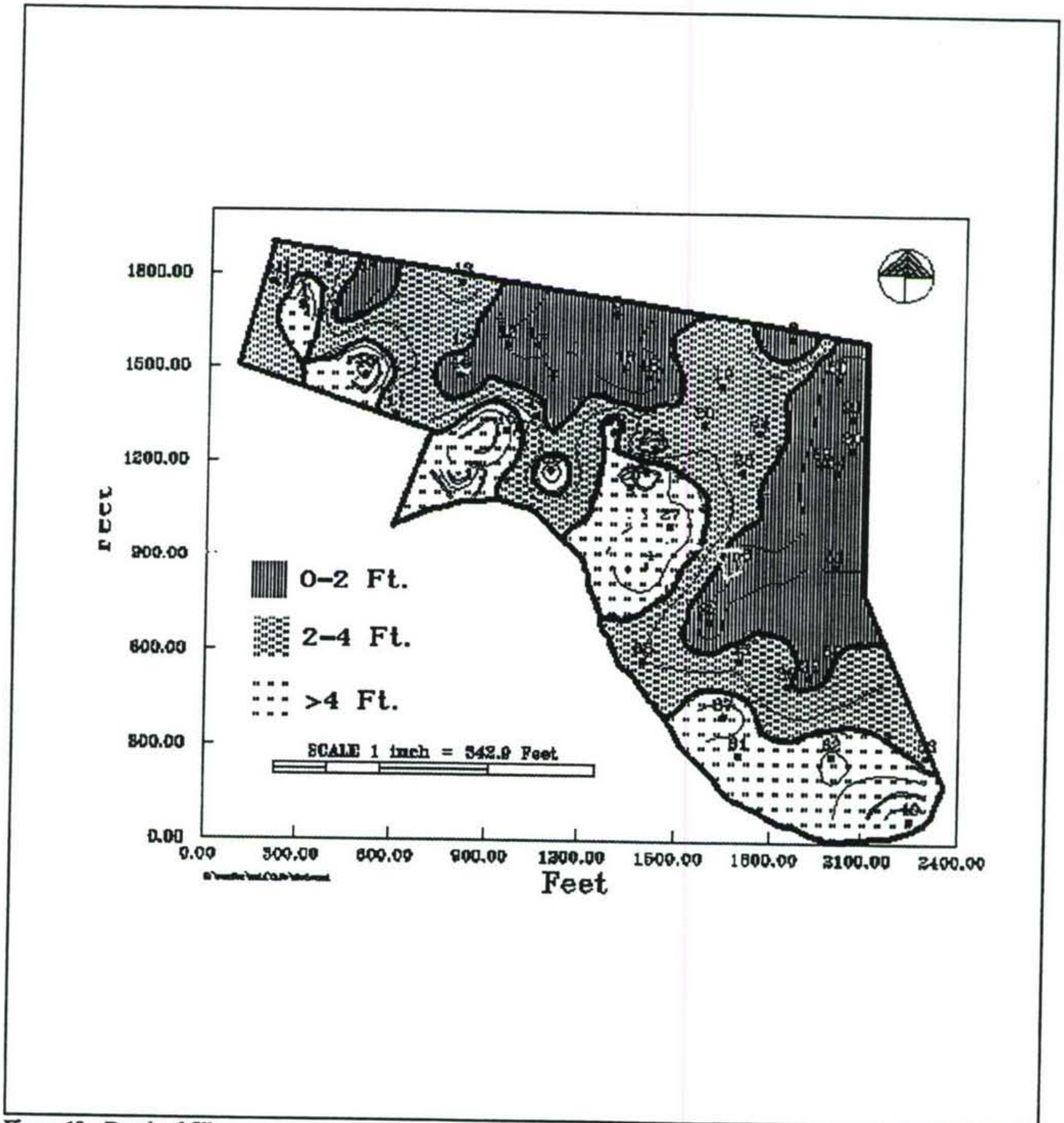


Figure 18 - Depth of fill.

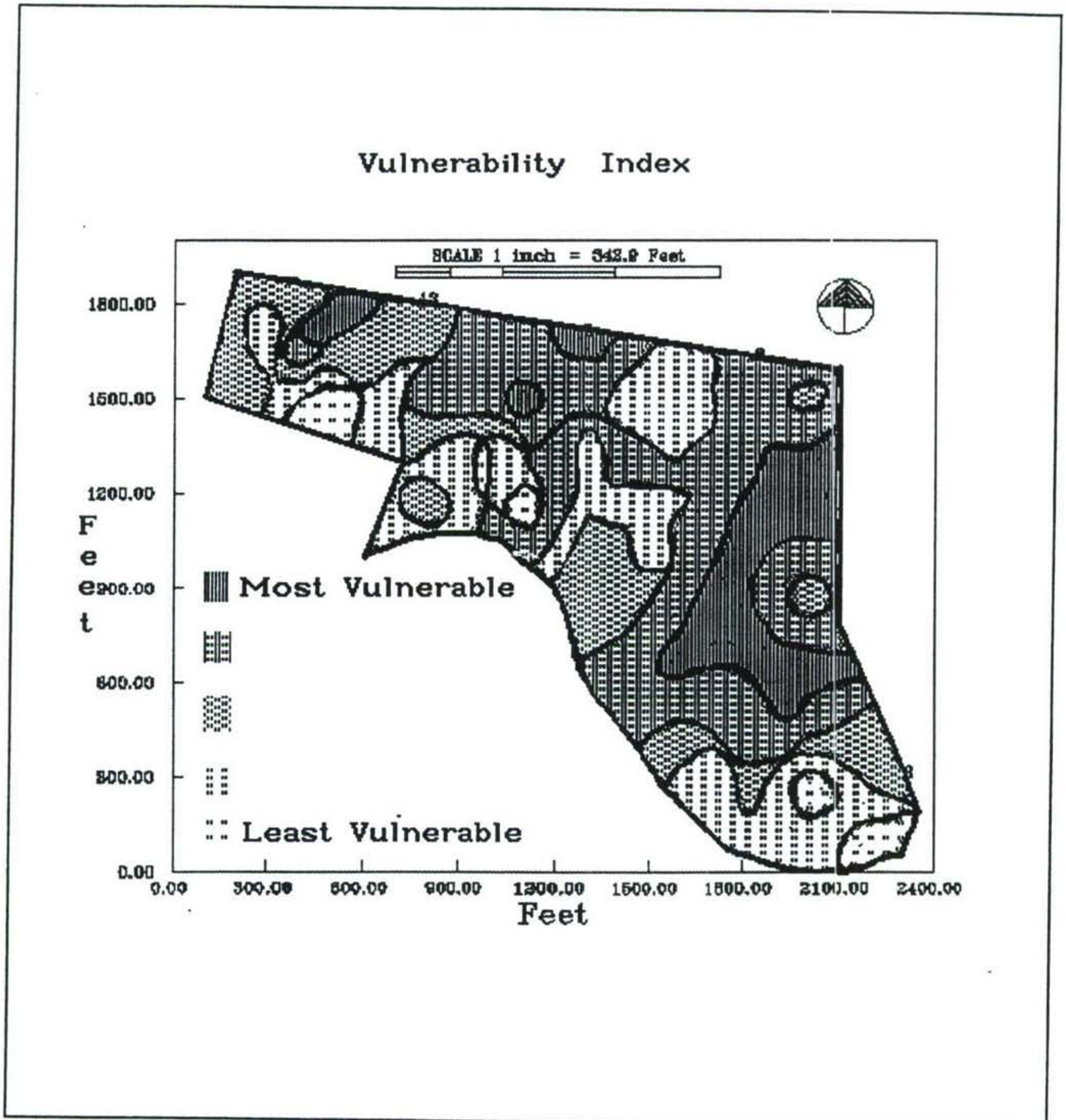


Figure 19 - Vulnerability.

Table 4 - Vulnerability Index

FILL (in feet)	ARCHAEOLGOICAL POTENTIAL		
	HIGH	MEDIUM	LOW
0-2	◘	☼	⊠
2-4	☼	⊠	♦
>4	⊠	♦	■

Vulnerability: ◘ = Highest — Requires testing prior to ground disturbance
☼
⊠

♦ — Construction monitoring
■ = Lowest

C. Identifying the Known Prehistoric Site

Timelines' core no. 22 comes the closest to the location of 19-MD-323. A careful analysis of this core revealed no material diagnostic of a prehistoric site (Table 1, page 6). Indeed, the zone where prehistoric evidence might have existed was occupied in this core by rock.

D. Identifying the Known Historic Sites

Table 2 (page 8) illustrates the results of careful analysis of those cores closest to historic sites identified in the PAL research documentation. A copper artifact found in core no. 1 from the location of Bird-2 is possible evidence for a historic site remaining at this location, although this area of medium potential is covered by 4.5 ft. of fill. Evidence for the existence of Arsenal Site no. 8 may be the slate fragments found at a depth of 7 ft. in a zone of high potential under approximately 4.5 ft. of fill. There does not appear to be any evidence to confirm or deny the existence of the historic sites expected to have been on the site. Test excavations designed to locate these sites would be required to supply these data.

REFERENCES CITED

Barfield, Thomas J. and Russell J. Barber
1982 The Amphitheater Site: A Late Archaic Settlement in Watertown, Massachusetts. Institute for Conservation Archaeology, Peabody Museum, Harvard University, Cambridge.

Fitch, Virginia A. and Suzanne Glover
1989 Historic and Prehistoric Reconnaissance Survey, Army Materials Technology Laboratory, Watertown, Massachusetts. The Public Archaeology Laboratory, Inc., Pawtucket, RI.

APPENDIX A

ARTIFACT CATALOGUE

02/25/1992
16:32:12

LABORATORY CATALOGUE LISTING

Catalogue #	Segment #	Zone #	Unit Type	Unit#	Layer	Level	Quantity	Material	Diagnostics	Date Range
1			Core	08-3	1.5-2		2	Coal	Coal	
2			Core	12-3	4-4.6		1	Porcelain	Porcelain	
3			Core	01-1	6-8		1	Copper		
4			Core	GR-5	2-4		3		Nail, Indeterminate	
5			Core	11-1	1-2		25	Brick	Brick	
7			Core	08-2	1-2		1	Brick	Brick	
8			Core	08-2	1-2		1	Lead		
9			Core	03-1	1		1	Brick	Brick	
10			Core	03-2	1		2	Brick	Brick	
11			Core	03-2	1		1	Brick	Brick	
12			Core	03-2	3		1	Cinders/Clinkr	Clinker	
						Total Artifacts	39			

APPENDIX B

TIMELINES BORING LOGS

TIMELINES INC.

Boring Record

Date 10-13-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 01SB-1 (13)

Geo. Tech. Eng.

Driller

asphalt

* augured through macadam - 0.5'

.5 fill — sand & gravel, 10YR5/4
1.8 fill — sandy loam, 10YR3/2
2

Sample# 1

2 fill — sandy loam w/ gravel, 10YR3/2
2.8 fill — brick
3

Sample# 2

4 fill — sand w/ ash & gravel
4.5 — 10YR3/2

Sample# 3

6 fill — sand & gravel, 10YR3/1 - *4/2
7

Sample# 4

8 fill — sand & gravel, 10YR3/3
8.2 natural — sandy loam, 10YR3/2
8.7

Sample# 5

* copper ~~plate~~ artifact recovered from augured soil 6-8 feet

10 — loamy sand & pebbles, 10YR3/2
11 — bedded sand, 10YR 7/3-7/4
11.5

Sample# 6

12 — sand, 10YR 7/4
13.5

Sample# 7

14 — wet sand, 10YR 7/4
18

Sample# 8 & 9

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

2

TIMELINES INC.

Boring Record

Date 10-13-91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 01SB-2(12) Geo. Tech. Eng. ______ Driller ______

* augured through macadam – 0.5'

Sample#	Depth	Unit	Description
1	.5 – 1.3	fill	sand w/ gravel 10YR5/4
	1.3 – 2	fill	sand w/ gravel 10YR2/2 & 7/1
2	2 – 2.4	fill	sand w/ pebbles 10YR3/2
	2.4		augured through cobbles
3	4 – 4.4	fill	sand w/ pebbles & cobble frags.
	4.4		10YR 3/2
4	6 – 8		no recovery
5	8 – 8.5	natural	sand 10YR 3/2
	8.5 – 9		sand w/ pebbles 10YR 4/6
6	10 – 12		sand w/ some pebbles 10YR4/6 – 6/4
7	12 – 12.9		sand w/ some pebbles 10YR 6/4 – 5/6
	12.9 – 13.2		very fine sand 10YR 5/2
8	14 – 14.5		sand w/ pebbles and cobble frags.
	14.5		10YR 7/2 – 6/6
			augured through cobbles

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-13-91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 01SB-2 (12) Geo. Tech. Eng. Driller

17
sand w/ pebbles 10YR6/4
17.2
fine sand 10YR5/3
17.7
sandy clay 5Y5/1
19.4

19
wet sandy clay 5Y5/1
21

Sample# 9 10

Sample#

J--Judgmental Unit
S--Systematic Unit
X--Artifact
Key

3

TIMELINES INC.

Boring Record

Date 10/8/91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2 1/2 in. Recorded by ED

Boring # 01SB-3 Geo. Tech. Eng. WESTON Driller R&R

All DEPTHS IN FEET - CONCRETE SURFACE

Sample#	Depth	Description
1	SURFACE 0 – 2	Concrete
2	2 – 3.7	Concrete fragments
	3.7 – 4	Sand with clayey silt particles
3	4 – 6	moist silt, no gravel
4	6 – 8	olive brown clayey silt
5	8 – 10	olive brown clayey silt
6	10 – 12	olive brown clayey silt some gravel
7	12 – 14	Very moist silt, little to no gravel
8	14 – 16	Quite moist silt, practically no gravel Color changes to slightly bluish

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

11/18/1991 03:24 FROM W BKB INT PRIV BKG TO 915084489205 P.04

4

B/Dg 311

TIMELINES INC.

Boring Record

Date 11-10

Page 1 of 1

Project H2O Tank

Spoon Diameter 2.5"

Recorded by MR

Boring # 02 SB-2

Geo. Tech. Eng. WESTON

Driller R&R

Sample#	Depth	Description
1	0–2	CEMENT (0–1); NO RECOVERY (1–2)
2	2–4	~~SILTY~~ SANDY SILT 10YR 3/2
3	4–6	SANDY SILT 10YR 3/1; SAND GRAV. 10YR 5/2
4	6–8	FINE SANDY SILT LARGE GRAV 10YR 4/2; COARSE SAND w/ SILT 10YR 4/1
5	8–10	COARSE SILTY SAND 10YR 4/1
6	10–12	COARSE SILTY SAND 10YR 4/1; CLAYEY SILT 10YR 3/2
7	12–14	SILTY CLAY 10YR 3/2
8	14–16	SILTY CLAY 10YR 3/2 H2O

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

5

B/DG 311

TIMELINES INC.

Boring Record

Date 11-10

Page 1 of 1

Project H2O Tower

Spoon Diameter 2.5"

Recorded by MB

Boring # 023B-3

Geo. Tech. Eng. WESTON

Driller R&R

MAJ/ER

Sample#	Depth	Description
1	0–1	CONCRETE
	1–2	Topsoil DRK BRN silt 10YR 2/2
2	2–3	silty SAND 10YR 6/3
	3–4	10YR 6/3 SAND GRAV.
3	4–6	SAND & GRAV 10YR 5/3
4	6–8	SAND GRAV. 10YR 5/3
5	8–9	SAND GRAV 10YR 5/3
	9–10	CLAYEY silt 10YR 4/3
6	10–12	CLAYEY silt 10YR 4/3
7	12–14	CLAYEY silt 10YR 4/3
8	14–16	silty CLAY 10YR 4/3

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

6

TIMELINES INC.

Boring Record

Date 10-13-91

Page 1 of 1

Project Watertown Arsenal — Spoon Diameter 2.5" — Recorded by JPMc

Boring # 02 SB-4 (11) — Geo. Tech. Eng. ______ — Driller ______

* augured through macadam and cement - 1.0'

Sample # 1
- 1 – 1.8: fill — course sand w/ slag, cinders, and gravel 10YR 2/1

Sample # 2
- 2 – 2.6: fill — course sand w/cinders & gravel 10YR 2/1
- 2.6 – 3.1: natural — course silty sand w/ pebbles 10YR 4/4

Sample # 3
- 4 – 4.6: course sand w/ pebbles 10YR 5/4

Sample # 4
- 6 – 6.9: course sand w/ pebbles 10YR 6/3
- 6.9: augured through cobbles ↓

Sample # 5
- 10 – 11.6: course sand w/ pebbles 10YR 6/3
- 11.6 – 12: silty clay 10YR 5/3

Sample # 6
- 12 – 12.8: silty clay 10YR 5/3
- 12.9: fine silty clay 10YR 6/3

Sample # 7
- 14 – 16: fine silty sand & silty clay 10YR 5/3-6/3

Sample # 8
- 16 – 18: wet fine silty sand & clay 10YR 5/5-6/3

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

7

TIMELINES INC. BLDG 43

Boring Record

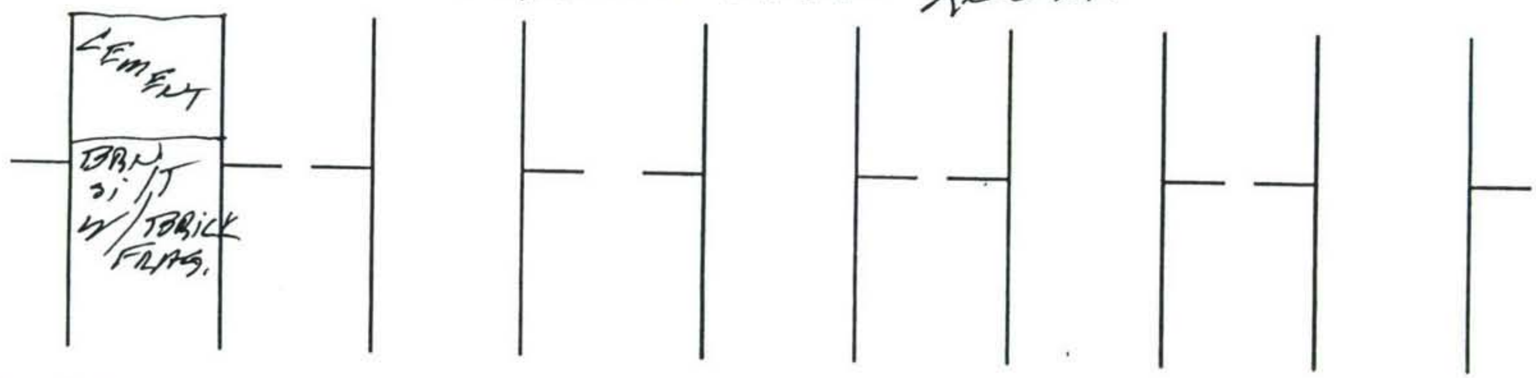
Date 11-11

Page 1 of 1

Project H2O Town Spoon Diameter NA Recorded by

Boring # 035B-1 Geo. Tech. Eng. WESTON Driller R&R

ONE SCOOP SAMPLE FROM UNDER FLOOR- URANIUM OVEN ~~ROOM~~ ROOM.



Sample#

Sample#

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

8

TIMELINES INC.

Building 43

Boring Record

Date 11-8

Page 1 of 2

Project H2O Tower

Spoon Diameter 2.5"

Recorded by MR

Boring # 035B-2

Geo. Tech. Eng. WESTON

Driller R&R

NOV 9

Sample# 1 (0 – 1' – 2')

CONCRETE

DARK DAMP FILL

10 YR 3/2

Sample# 2 (2' – 3' – 4')

NO RECOVERY BRICK PLUG AT END OF TOOL.

Sample# 3 (4' – 5' – 5.3')

DARK DAMP FILL

10 YR 3/2

SLAG.

DRY COURSE SAND

10 YR 6/6

BROKEN GRANITE; GRANITE STONE

Sample# 4 (6 – 7 – 8)

Fill

10 YR 6/6

GRAV. LENS 10 YR 6/3

FINE SAND 10 YR 7/6

Sample# 5 (8 – 9 – 10)

FINE SAND

10 YR ~~3/6~~ 3/2

SILTY FINE SAND 5/4

SAND W/ GRAV.

10 YR 5/4

Sample# 6 (10 – 11 – 12)

COURSE SAND GRAV.

10 YR 5/4

Sample# 7 (12 – 13 – 14)

COURSE SAND GRAV

BRICK FRAG

10 YR 5/4

Sample# 8 (14 – 15 – 16)

COURSE SAND GRAV

10 YR 5/4

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

TIMELINES INC.

Boring Record

Date 11-9

Page 2 of 2

Project ____ Spoon Diameter ____ Recorded by ____

Boring # 03SB-2 Geo. Tech. Eng. ____ Driller ____

Fill

COARSE SAND 10YR GRAV. 5/4 — 16 — 16.5

SAND 10YR 5/6 — 17 — 18

10YR C/3 — 18

CLAYEY SAND 10YR 5/4 — 19 — 20

Sample# 10 — 11

Sample# __

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

10

TIMELINES INC.

Boring Record

Date 10-27-91

Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 04SB-1 (35) Geo. Tech. Eng. Driller

* augured through macadam - .5'

.5

Fill

.8

sand & gravel 10YR2/1

silty sand

1.1

10YR5/3

2

2.5

cement-hit steel

@ 2.5'

Sample# 1

2

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

11

TIMELINES INC.

Boring Record

Date 10/8/91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2½ in Recorded by ED

Boring # 03SB-1-MW21 (Monitoring well) Geo. Tech. Eng. Weston Driller R&R

All DEPTHS IN FEET

Sample#	Depth (ft)	Description
1	5–7	yellow brown sand with gravel + small stones.
2	10–12	olive brown silt, some gravel
3	18–20	olive brown silt, some gravel.
4		
5		

Sample# ---- ---- ----

J--Judgmental Unit X--Artifact
S--Systematic Unit

Key

12

TIMELINES INC.

Boring Record

Date 10-24-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 05SB-2 (23)

Geo. Tech. Eng.

Driller

0
humus
sandy loam 10YR3/4
.6
fill
sand & ash 10YR2/2
2

Sample# 1

2
fill
sand & ash 10YR2/1
2.7
disturbed ?
sandyloam w/pebbles and gravel 10YR4/2
3.4

Sample# 2

4
natural
sandy loam w/pebbles 10YR3/2
4.4
sand w/ pebbles 10YR5/3
5.6

Sample# 3

6
sand w/ pebbles 10YR6/2
6.4

Sample# 4

8
sand w/ pebbles 10YR6/3
8.7
fine sandy silt & clay 10YR5/3
9.5

Sample# 5

10
wet fine Sandy silt & clay 10YR5/3
12

Sample# 6

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

13

TIMELINES INC.

Boring Record

Date 10-10-91

Page 1 of 3

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPM^c

Boring # 06SB-1 (6)

Geo. Tech. Eng.

Driller

Sample# 1

- 0 — humus — silty loam 10YR 3/2
- .5 — fill — gravel, sand, & silt 10YR 3/1
- 1.5

Sample# 2

- 2 — fill — gravel, sand & small cobbles 10YR 6/1 - 6/2
- 3

Sample# 3

- no recovery

Sample# 4

- 5 — fill — silty sand w/gravel & pebbles ~~10YR 4/4~~
- 5.5 — natural — compact silty sand 10YR 4/4/5/4
- 6

Sample# 5

- 6 — natural — course sand w/pebbles & small cobbles 10YR 5/3
- 7.75

Sample# 6

- 8 — course sand w/pebbles 10YR 5/3
- 10

Sample# 7

- 10 — course sand w/pebbles 10YR 5/3
- 10.5 — silty clay 10YR 4/4
- 11.5

Sample# 8

- 12 — silty clay 10YR 5/4-4/4
- 14

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-10-91

Page 2 of 3

Project Watertown Arsenal   Spoon Diameter 2.5"   Recorded by JPMC

Boring # 06 SB-1 (6)   Geo. Tech. Eng.   Driller

Sample #	Depth	Description
9	14–14.5	silty clay, sand & pebbles' 10YR 3/2
	14.5–16	silty clay 10YR 3/2
10	16–18	bedded silty sand 10YR 5/2-5/3
11	18–20	wet bedded sand, silty clay, & clay 10YR 5/2-5/3
12	25–26.2	silty sand 10YR 7/2
	26.2–27	clay 5Y 4/1
13	30–30.4	clay-silt 10YR 6/1
	30.4–31.6	silty clay 10YR 5/3
	31.6–32	clay-silt 10YR 6/1
14	35–35.9	clay-silt 10YR 6/3
	35.9–36.2	silty clay 10YR 5/1
	36.2–37	clay-silt 10YR 6/3
15	40–40.9	clay-silt 10YR 6/3
	40.9–41.3	silty clay 10YR 5/1
	41.3–42	clay-silt 10YR 6/3
16	45–47	sandy silt 10YR 7/2

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

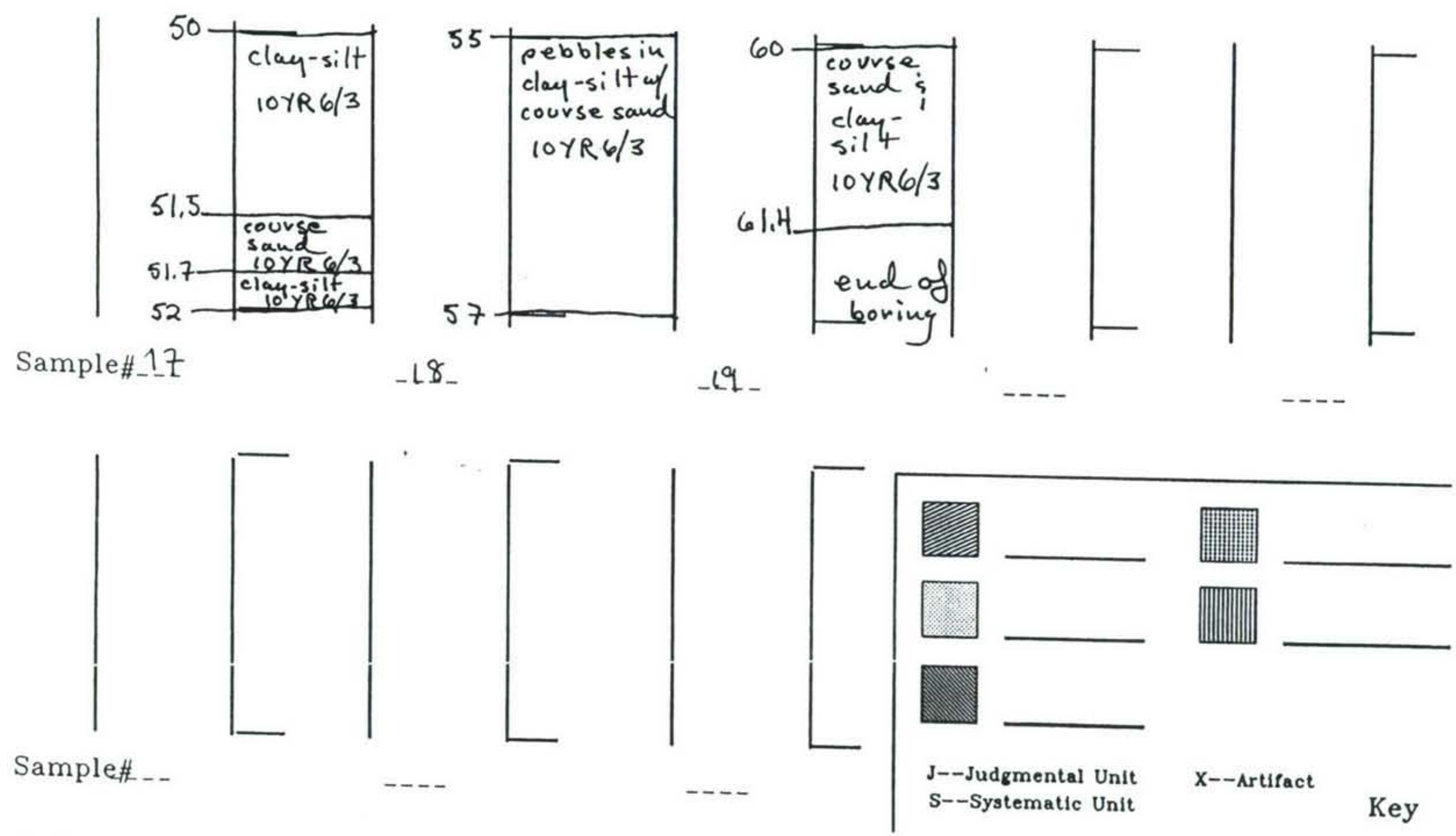
TIMELINES INC.

Boring Record

Date 10-10-91

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 06SB-1 (6) Geo. Tech. Eng. Driller



14

TIMELINES INC.

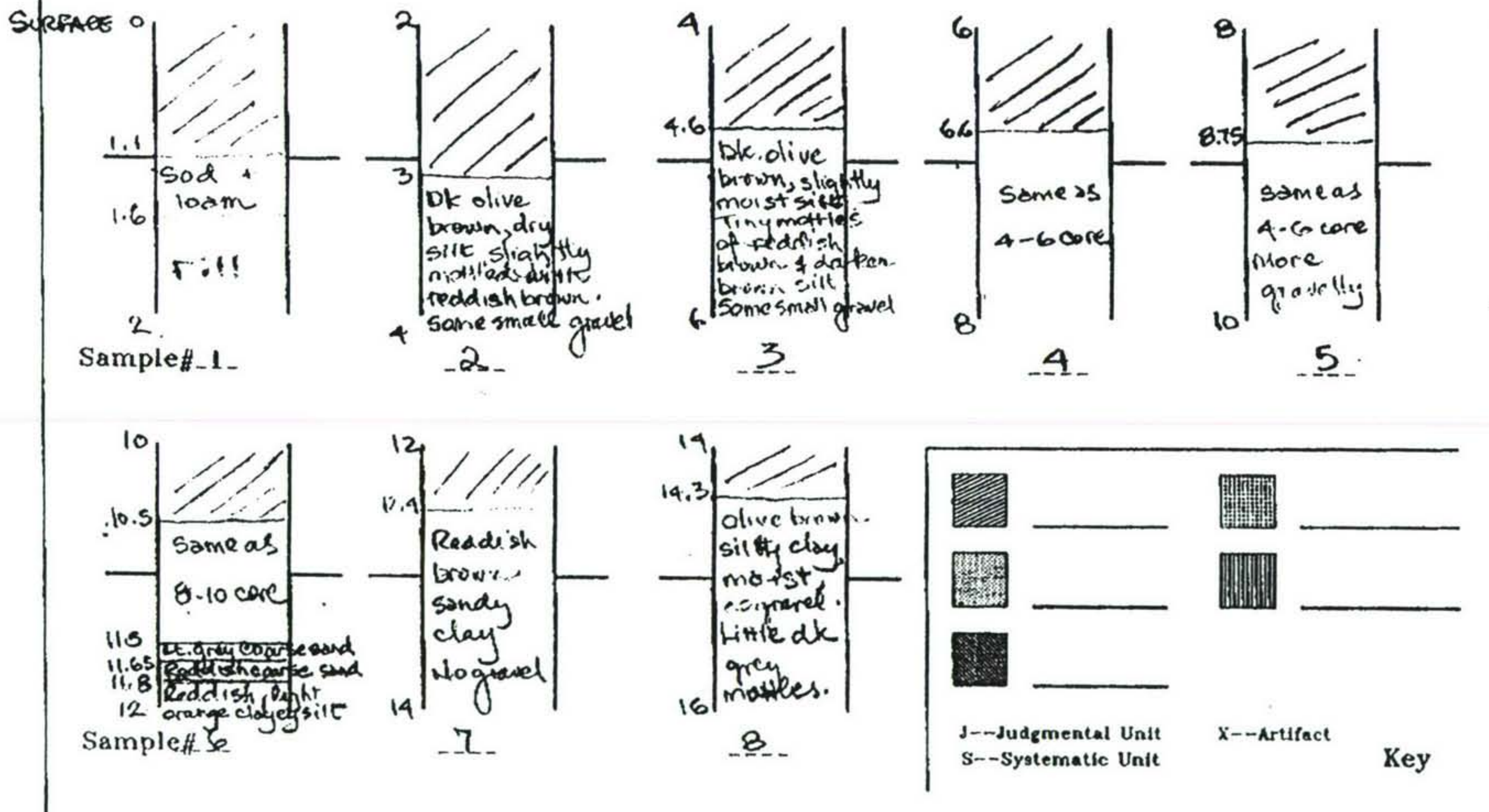
Boring Record

Date 10/8/91 Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by E. Decima

Boring # 06SB-2 Geo. Tech. Eng. WESTON Driller R&R

ALL DEPTHS in FEET - GRASS SURFACE



TIMELINES INC.

Boring Record

Date 10/[illegible]/91 Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by E. DeLuna

Boring # 063B-2 Geo. Tech. Eng. Weston Driller R&R

ALL DEPTHS in FEET

16
olive brown, slightly sandy clay quite moist
Traces of reddish mottling.
almost no gravel.
18

Sample# 9

Sample#

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

15

TIMELINES INC.

Boring Record

Date 10-11-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPM^c

Boring # 06SB-3 (7)

Geo. Tech. Eng.

Driller

* augured through macadam and gravel -0.5'

Sample# 1
0.5 – 1: fill — gravel & ash, 10YR3/1

Sample# 2
2 – 4: no recovery — augured down

Sample# 3
4 – 4.8: fill — gravel & ash, 10YR3/1
4.8 – 5: silty clay & pebbles, 10YR 3/4-4/4

Sample# 4
6 – 7.3: fill — clay, sand & gravel, 10YR4/4-6/2-6/4

Sample# 5
8 – 8.5: fill — gravel & silty clay, 10YR3/1
8.5 – 8.6: fill — brick
8.6 – 9.4: fill — clay, silt, & gravel, 10YR4/4-4/2-6/4

Sample# 6
10 – 12: natural — sand & pebbles, 10YR4/4-6/4

Sample# 7
12 – 13.3: course sand & pebbles, 10YR4/4

Sample# 8-9
15 – 20: silty clay, 10YR 4/4-5/4-5/2-6/2

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

16

TIMELINES INC.

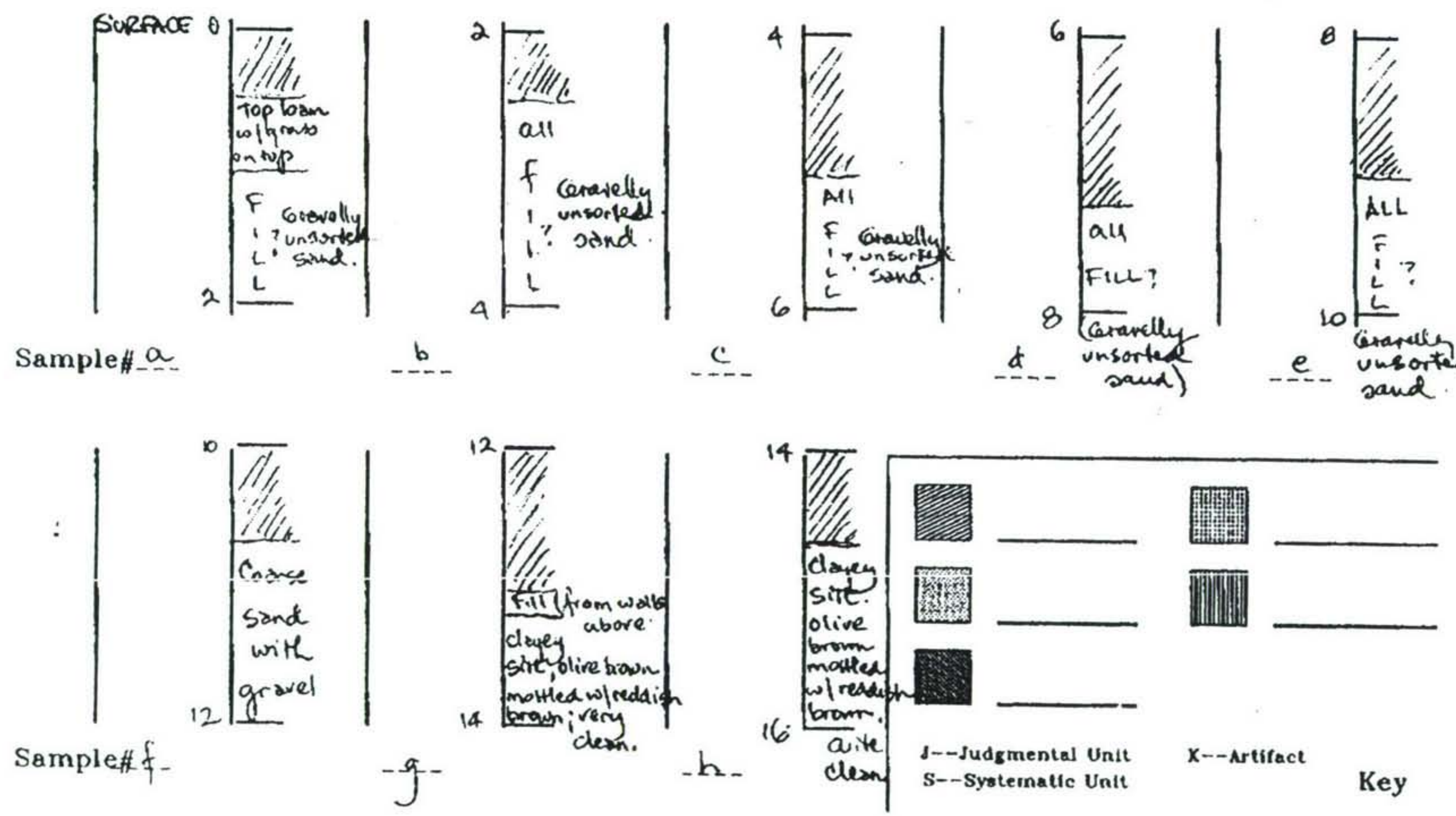
Boring Record

Date 10/9/91 Page 1 of 2

Project MTL Spoon Diameter 2 1/2 in Recorded by E. Delima

Boring # 063B-4 Geo. Tech. Eng. Weston Driller R & R

all depths in feet - Grass surface on this site



11/18/1991 08:26 FROM W BKB INT PRIV BKG TO 915084489205 P.08

TIMELINES INC.

Boring Record

Date 10/9/91 Page 2 of 2

Project HTL Spoon Diameter 2 1/2 in. Recorded by E Dkima

Boring # 06SB-4 Geo. Tech. Eng. Weston Driller R&R

Ft.

16

Very moist silt, some dripping with water. No mottling

18

Sample# 1

Sample#

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

17

TIMELINES INC.

Boring Record

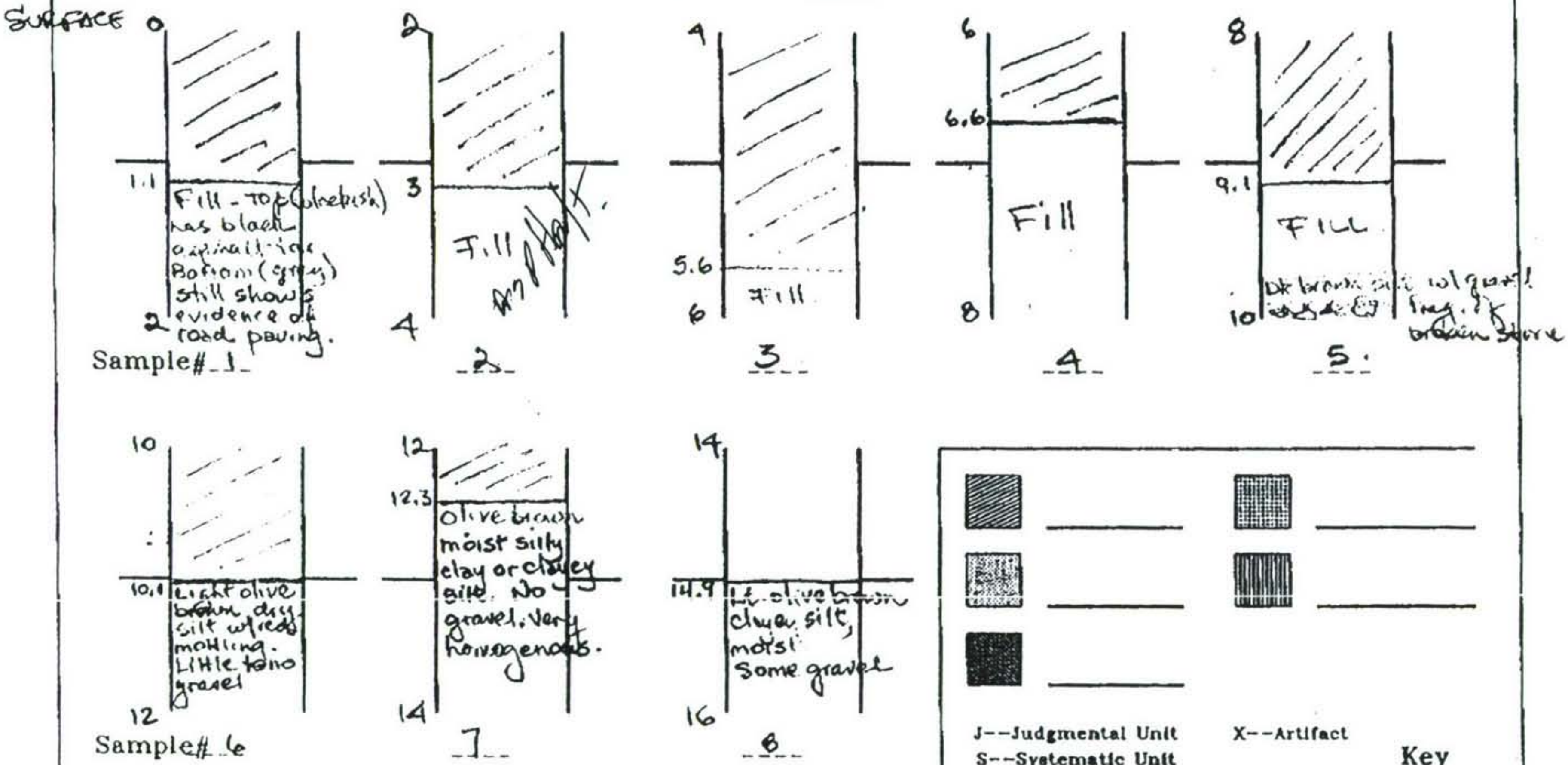
Date 10/9/91

Page 1 of 2

Project: Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by ED

Boring # 06SB-5 Geo. Tech. Eng. Weston Driller R & R

All DEPTHS in FEET. GRASS SURFACE



TIMELINES INC.

Boring Record

Date 10/9/91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by E. DeLuca

Boring # 06SB-5 Geo. Tech. Eng. Weston Driller R & R

All depths in feet

Sample #	Depth (top)	Description	Depth (bottom)
9	16	No RECOVERY (Core went straight through; wet)	18
10	18	NO RECOVERY	20
11	25 / 26	olive brown wet silt some gravel	27
12	30	olive brown wet silt	31
	31	Blue clay	32
13	35 / 35.3	Sandy silt with small lens of blue clay	37
14	40	Blue clay	
		wet yellow clay Banded with a brighter yellow	42

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

11/18/1991 08:27 FROM W BKB INT PRIV BKG TO 915084489205 P.11

18

TIMELINES INC.

Boring Record

Date 10-12-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 07SB-1 (10)

Geo. Tech. Eng.

Driller

Sample#	Depth	Unit	Description
1	0 – .4	humus	silty loam 10YR3/1
	.4 – 1.1	fill	sand w/ fine gravel 10YR6/4
	1.1 – 1.6	fill	sandy loam w/ gravel 10YR 3/1
2	2 – 2.6	natural	sandy loam w/ pebbles 10YR4/4
	2.6		hit rock - augured down
3	5 – 5.7		Sand w/ pebbles 10YR7/1 - 6/2 4/3
4	7 – 7.8		Sand & pebbles 10YR 5/3
5	8.5 – 9.5		sand w/ pebbles 10YR 5/3
	9.5		augured through cobbles
6	12 – 12.5		sand w/ pebbles 10YR5/3
	12.5 – 13		silty sand 10YR4/4
	13 – 14		silty clay 10YR 5/2 4/2
7	14 – 16		wet silty clay 10YR 5/2

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

19

TIMELINES INC.

Boring Record

Date 11-14

Project H2O Town

Boring # 08 SB-2

Spoon Diameter 2.5"

Geo. Tech. Eng. Weston

Page 1 of 1

Recorded by MR

Driller R&R

Fill

Depth	Description	Depth	Description	Depth
0	Concrete			
8"	Dark sandy silt 7.5YR 3/0 — Brick Frag.	2	Sand Grav. 10YR 6/2	4
1	10YR 4/6 — Brick Frag.		Sand Grav. 10YR 6/2	
2		4		6

Sample# 1

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

20

TIMELINES INC.

Boring Record

Date 11-14

Project H2O Towr — Spoon Diameter 2.5" — Recorded by MR

Boring # OBSB-3 — Geo. Tech. Eng. WESTON — Driller R&R

Page 1 of 1

Sample# 1 (0–2)
- 0
- CONC.
- 10"
- AUGER DUST
- 1.5
- CONDUIT. 5YR 2.1/1
- 2

Sample# 2 (2–4)
- 2
- Coal/ST 8/4 5YR 2.5/1
- 3
- FINE SAND 7.5YR 4/4
- 4

Sample# 3 (4–6)
- 4
- Fill
- SILTY SAND 10YR 6/F
- 5
- FINE SAND 10YR 6/6
- 5.5
- SAND GRAV 10YR L/2
- 6

Sample# 4 (6–8)
- 6
- SAND GRAV 10YR 6/2
- 8

Sample# 5 (8–10)
- 8
- SAND GRAV 10YR 6/2
- 10

Sample# 6

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

21

TIMELINES INC.

Boring Record

Date 10-12-91

Page 1 of 2

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 09SB-1 (9)

Geo. Tech. Eng.

Driller

Sample#	Depth	Note	Description
1	0	humus	sandy loam w/ small gravel 10YR2/1
	1.3		
2	2	fill	sandy loam w/ gravel 10YR 4/2-5/1
	2.9	fill	silty clay 10YR4/4
	3.1		
3	4	fill ?	silty clay w/ gravel 10YR2/1
	4.5		
4	6	natural	silty sand and pebbles 10YR 7/2-5/3
	7.2		
5	8		course silty sand w/ pebbles 10YR 7/2-5/4
	9.3		augured through cobbles
6	18		course sand w/ pebbles 10YR 7/2
	18.6		fine silty sand 10YR 6/2
	19.3		
7	20		fine sand 10YR 6/3
	21.2		
8	22		fine sand 10YR6/3
	22.2		course sand w/pebbles 10YR5/3
	23.5		

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

TIMELINES INC.

Boring Record

Date 10-12-91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMC

Boring # 09SB-1 (9) Geo. Tech. Eng. Driller

Sample#	Depth (top)	Description	Depth (bottom)
9	24	course sand w/ pebbles 10YR 7/2-5/3	25
10	26	course sand and pebbles 10YR 7/2-5/3	27.5
11	28	course sand w/pebbles 10YR 7/2-5/3	28.5
12	30	course sand w/pebbles 10YR 7/2-5/3	31.3
13	32	course sand w/pebbles 10YR 7/2-5/3	33.2 water
14	34	wet course sand w/ pebbles 10YR 7/3-5/4	35.5

J--Judgmental Unit
S--Systematic Unit
X--Artifact
Key

TIMELINES INC.

Boring Record

Date 10-14-91

Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 10SB-1 (16) Geo. Tech. Eng. Driller

* augured through macadam - .5'

Sample# 1

.5 fill – sandy/ some gravel 10YR 3/2 - 7/2 - 6/4

1.5

Sample# 2

2 fill – silty sand w/ gravel 10YR 3/2

3.2 fill – brick

3.6

Sample# 3

4 fill – silty sand w/gravel - very small brick frags 10YR 4/2

5.2

Sample# 4

6 natural – sand w/ pebbles 10YR 6/4

7.4

Sample# 5

8 no recovery - hit rock - augured down

10

Sample# 6

10 – sandy silt w/pebbles 10YR 5/4

10.3

Sample# 7

14 – sandy silt w/pebbles

14.1 – 10YR 7/1

Sample# 8 & 9

16 – sandy silt w/ pebbles 10YR 7/1

16.6 – clay silt 10YR 5/2

18 – wet clay silt 10YR 5/3

20

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

23

TIMELINES INC.

Boring Record

Date 10-15-91

Project Watertown Arsenal   Spoon Diameter 2.5"   Recorded by JPMc   Page 1 of 2

Boring # 10SB-2(17)   Geo. Tech. Eng.   Driller

* augured through macadam - .5'

Sample# 1
- .5 fill — sand w/ gravel 10YR5/6
- 1 fill — sand w/ gravel & pebbles 10YR 6/6
- 1.7

Sample# 2
- 2 fill — sand w/ gravel 10YR6/6
- 2.3 natural — sandy loam 10YR3/2
- 2.6 — loamy sand w/pebbles
- 3.4

Sample# 3
- 4 — sandy pebbles 10YR6/4
- 5.7

Sample# 4
- 6 — sand w/ pebbles & cobble frags, 10YR6/6
- 7

Sample# 5
- no recovery - hit rock - retried

Sample# 6
- 8 — sand w/ pebbles, 10YR6/4 *
- 10

Sample# 7
- 10 — sand 10YR6/6
- 10.8 — sand w/ pebbles 10YR5/6-4/3
- 12

Sample# 8
- 12 — sand w/ pebbles 10YR 4/3-7/3 5/6
- 13.5

* possible chip recovered from core

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-15-91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 10SB-2 ~~(15)~~ (17) Geo. Tech. Eng. ____ Driller ____

Sample#	Depth (top)	Description	Depth (bottom)
9	14	sand w/pebbles 10YR 5/4	15.6
10	16	course sand w/pebbles 10YR 6/4	17.7
11	18	sand w/ pebbles 10YR3/3	18.5
	18.5	sand w/ pebbles- petro odor 10YR2/1	19.5
12	20	sand w/pebbles- sat. w/ oil 10YR2/1	21.7

Sample# ---- ---- ----

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

24

BLDG 37

TIMELINES INC.

Boring Record

Date 11-12

Page 1 of 2

Project H&D Town

Spoon Diameter 2.5"

Recorded by MR

Boring # 11SB-1

Geo. Tech. Eng. Weston

Driller R&R

0
CEMENT
1
SANDY SILT 7.5YR 3/2
2

SLAG METAL COAL / WASTE

Sample# 1

2
NO RECOVERY
3
4

Sample# 2

4
SANDY SILT 7.5YR 3/2
5
MED SAND 10YR 5/4
MED SAND 10YR 6/3
6

Sample# 3

6
MED SAND 10YR 6/3
7
8

Sample# 4

8
MED SAND 10YR 6/3
9
FINE SAND GRAV. 10YR 7/3
10

Sample# 5

10
FINE SAND GRAV. 10YR 7/3
11
12

Sample# 6

12
SAND GRAV 10YR 7/3
13
14

Sample# 7

14
SAND GRAV 10YR 7/3
15
16

Sample# 8

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

TIMELINES INC.

Boring Record

Date 11-12 | Page 2 of 2

Project H2O Town | Spoon Diameter 2.5" | Recorded by MR

Boring # 11SB-1 | Geo. Tech. Eng. Weston | Driller R&R

Depth	Description	Sample#
16–17	SAND GRAV. 10YR 7/3	9
17–18		
18–19	SAND GRAV 10YR 7/3	10
19–20	MED SAND LG GRAV 2.5YR 4/4	
20–21	MED SAND LG STONES	11
21–22	10YR 5/3	
22–23	MED SAND LG STONES	12
23–24	CLAYEY SAND 10YR 4/4	
24–25	CLAYEY SAND	13
25–26	10YR 4/4	

Sample# ____ ____ ____

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

25

TIMELINES INC.

Boring Record

Date 10-17-91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 12SB-1(21) Geo. Tech. Eng. ____ Driller ____

* augured through macadam - .125'

Sample# 1
- .25 fill — course sand w/ gravel 10YR6/3
- .5 fill — course sand 10YR3/1
- .55 fill — course sand, ash, & gravel 10YR 4/6-5/2
- 2

Sample# 2
- 2 fill — course sand w/ ash & brick frags 7.5YR3/2
- 3.2

Sample# 3
- 4 fill — course foamy sand w/ ash & brick frags, 10YR4/2
- 4.8 fill — sandy silt w/ gravel 10YR 4/2
- 5.2

Sample# 4
- 6 natural — course sand w/ pebbles & cobble frags, 10YR 5/4
- 5

Sample# 5
- 8 — course sand w/ pebbles & cobble frags, 10YR5/4
- 9.4

Sample# 6
- 10 — course sand w/ pebbles & cobble frags, 10YR6/6
- 11.6

Sample# 7
- 12 — course sand & pebbles 10YR6/4
- 13.5

Sample# 8
- 14 — course sand w/ pebbles 10YR 5/4
- 15.8

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

TIMELINES INC.

Boring Record

Date 10-17-91

Page 2 of 2

Project Watertown Arsenal   Spoon Diameter 2.5"   Recorded by JPMc

Boring # 12SB-1 (21)   Geo. Tech. Eng.   Driller

16 – course sand w/pebbles 10YR 6/2 – 18

Sample# 9

18. – course sand w/ pebbles 10YR 5/4 – 18.4 – bedded sands 10YR 6/2 – 20

10

20 – bedded sands 10YR 6/2 – 21.7

11

22 – bedded sands 10YR 6/2 – 7/2 – 24

12

24 – bedded sands ~~10YR~~ 10YR 6/2 – 26

13

26 – wet bedded sands 10YR 6/2 – 28

Sample# 14

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

26

TIMELINES INC.

Boring Record

Date 10-17-91 Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 12 SB-2 (20) Geo. Tech. Eng. Driller

Sample#	Depth	Unit	Description
1	0 – .6	fill	sandy loam w/ gravel & brick frag. 10YR 3/1
2	2 – 2.4	fill	Sandy loam w/ gravel & brick fragments 10YR 3/1
3	4 – 4.7	fill	loamy sand w/ gravel & brick frags 10YR 3/1
4	6 – 6.4	fill	course loamy sand w/ gravel 10YR 3/2
5	8 – 9	fill	loamy sand w/ gravel 10YR 3/2
5	9 – 9.3	? natural	course sand w/ gravel & pebbles 10YR 6/4
6	10 – 11.7	natural	course sand w/ pebbles & cobble fragments 10YR 6/3
7	12 – 14		course sand w/ pebbles & cobble fragments 10YR 6/3
8	14 – 15.4		course sand w/ pebbles & cobble frags. 10YR 6/4

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-17-91

Page 2 of 2

Project Watertown Arsenal   Spoon Diameter 2.5"   Recorded by JPMc

Boring # 12SB-2 (20)   Geo. Tech. Eng.   Driller

Sample #	Top depth	Description	Bottom depth
9	16	sand w/ pebbles ~~cobbles~~ & large cobble fragments 10YR 6/3	16.7
10	18	sand w/ pebbles & cobble fragments 10YR 5/3-6/4	19.6
11	20	sand w/ pebbles & cobble fragments 10YR 5/3-6/4	21.3
12	22	sand w/ pebbles & cobble fragments 10YR 5/4	23.7
13	24	Sand w/ pebbles 10YR 6/3	26
14	26	sand w/ pebbles 10YR 5/3	26.5
14	26.5	fine bedded sand 10YR 5/4 - 6/3 - 6/1	28
15	28	fine silty sand (petro odor) 5Y 4/4 - 5/1	30

J--Judgmental Unit   X--Artifact

S--Systematic Unit

Key

22

TIMELINES INC.

Boring Record

Date 10-23-91 | Page 1 of 2

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 12SB-3 (22) | Geo. Tech. Eng. | Driller

* augured through macadam - .5'

Sample #	Depth	Unit	Description
1	.5 – 1.7	fill	sandyloam w/gravel, ash, cement fragments 10YR 3/3
2	2 – 3.4	fill	sandyloam w/gravel, ash & brick frags. 10YR 2/2 - 4/3
3	4 – 4.6	fill	sandyloam w/gravel & * brick frags 10YR 2/2
3	4.6 – 6	disturbed?	sand w/ pebbles, gravel and brick frags. 10YR 5/3 -
4	6 – 8	natural	sand w/ pebbles & cobble frags. 10YR 5/3 - 7/2
5	8 – 9.6		silty sand and coursesand w/pebbles & cobble frags. 10YR 6/2 - 5/4
6	10 – 11.7		sand w/ pebbles & cobble fragments 10YR 6/3
7	12 – 13.6		sand w/ pebbles & cobbles frags. 10YR 6/3
8			

* porcelain fragment recovered from sample (insulator?)

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

TIMELINES INC.

Boring Record

Date 10-23-91 | Page 2 of 2

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 12SB-3(22) | Geo. Tech. Eng. | Driller

Depth	Description
16	sandy w/ pebbles & cobble frags. 10YR5/3-7/2
17.6	fine sandy clay 10YR6/2
17.8	

Sample# 9

Depth	Description
18	fine sand & sandy clay 10YR 5/3
20	

10

Depth	Description
20	fine sand & sandy clay 10YR5/3
22	

11

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

28/33

TIMELINES INC.

Boring Record

Date 10-14-91

Page 1 of 2

Project Watertown Arsenal — Spoon Diameter 2.5" — Recorded by JPMc

Boring # 11SB-2(14) — Geo. Tech. Eng. — Driller

* augured through macadam -.5'

Sample # 1 (.5 – 1.5)
- .5 – 1: fill — sand w/ gravel, 10YR5/4
- 1 – 1.5: fill — sand w/ gravel - brick frag., 10YR2/2 - ~~5/4~~ 7/1

Sample # 2 (2 – 2.5)
- 2 – 2.5: fill — sand w/ gravel - brick fragment, 10YR2/2 - 5/3

Sample # 3 (4 – 5.5)
- 4: natural — course sand w/ pebbles, 10YR5/6
- 5.5

Sample # 4 (6 – 6.5)
- 6 – 6.5: course sand w/ pebbles, 10YR7/2

Sample # 5 (8 – 8.5)
- 8 – 8.5: silty sand w/ pebbles, 10YR 3/3

Sample # 6 & 7
- no recovery - augured through cobbles ↓

Sample # 8 (14 – 15.7)
- 14 – 15.7: course sand w/ pebbles, 10YR ~~4/6~~ - 6/6

Sample # 9 (16 – 17.2)
- 16 – 17.2: course sand w/ pebbles and cobble frags, 10YR 6/3

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-14-91

Page 2 of 2

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMC

Boring # 11SB-2 (14)

Geo. Tech. Eng.

Driller

Sample#	Depth	Description
10	18 – 19.5	course sand w/ pebbles 10YR 6/4-7/2
11	20 – 21.6	course sand w/ pebbles 10YR 4/6-6/3
11	21.6 – 21.8	fine silt & sand 10YR 6/4
12	22 – 22.7	fine sandy silt 10YR 6/4
12	22.7 – 23.7	fine sand 10YR 6/6
13	24 – 25.6	wet sand 10YR 6/6

Sample#

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

29

TIMELINES INC.

Boring Record

Date 10-14-91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMC

Boring # 11SB-3 (15) Geo. Tech. Eng. Driller

* augured through macadam - .5'

Sample # 1

- .5 — fill 10YR2/1 — crushed macadam
- .7 — fill — sand 7.5YR3/2
- .9 — fill? — sand & gravel pebbles 10YR5/6
- 1.8

Sample # 2

- 2 — natural — sand w/ pebbles 10YR5/6
- 3.6

Sample # 3

- 4 — sand w/ pebbles 10YR6/2
- 5.5

Sample # 4

- 6 — no recovery — augured through cobbles
- 8

Sample # 5

- 8 — sand w/ pebbles 10YR5/4
- 9 — sand w/ pebbles 10YR6/6
- 9.7

Sample # 6

- 10 — sand w/ pebbles 10YR5/4
- 11.7

Sample # 7

- 12 — sand w/ some pebbles 10YR6/4
- 13.7

Sample # 8

- 14 — sand w/ some pebbles 10YR6/4
- 16

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

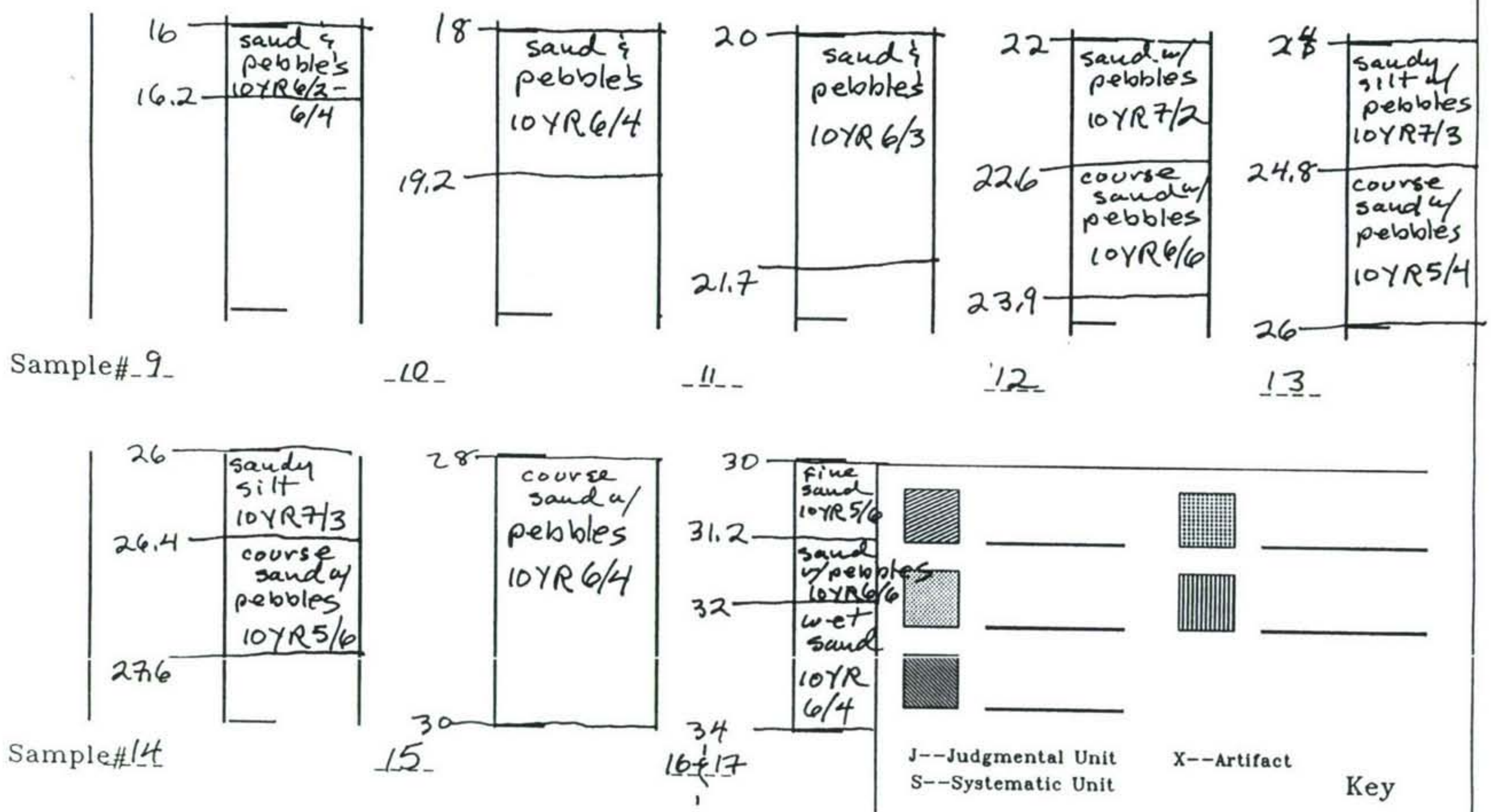
TIMELINES INC.

Boring Record

Date 10-14-91 Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 11SB-3 (15) Geo. Tech. Eng. Driller



30

TIMELINES INC.

Boring Record

Date 10-15-91

Page 1 of 3

Project Watertown Arsenal   Spoon Diameter 2.5"   Recorded by JPMc

Boring # 11SB-4 (18)   Geo. Tech. Eng.   Driller

Sample# 1
- 0–.4 humus: sandy loam 10YR3/2
- .4–.9 fill: loamy sand & gravel
- .9: 10YR2/1

Sample# 2
- 2–2.8 fill: sand & gravel 10YR3/1

Sample# 3
- 4–4.9 fill: loamy sand w/ gravel 10YR3/1

Sample# 4
- 6–7 natural: sandy pebbles 10YR6/4–7/2–5/3

Sample# 5
- 8–10: sand w/pebbles 10YR5/6

Sample# 6
- 10–10.7: sand w/ pebbles 10YR 5/6–6/2
- 10.7–11.2: sand w/ some pebbles
- 11.2: 10YR7/4

Sample# 7
- 12–13.6: sand w/ some pebbles 10YR6/3

Sample# 8
- 14–15.8: sand 10YR 6/3

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

TIMELINES INC.

Boring Record

Date 10-15-91 Page 2 of 3

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JAMc

Boring # 115B-4(18) Geo. Tech. Eng. Driller

16 — sand w/ pebbles & small cobbles 10YR 6/4 — 18
Sample# 9

18 — sand w/ pebbles & small cobbles 10YR 6/6 - 7/2 - 6/3 — 20
10

22 — sand w/ pebbles 10YR 6/6 — 23.6
11

24 — sand w/ pebbles 10YR 6/6 — 25.4
12

26 — sand w/ some pebbles 10YR 6/4 — 27.6
13

28 — sand w/ pebbles & small cobbles 10YR 7/2 — 29.6
Sample# 14

30 — sand w/ pebbles & small cobbles 10YR 6/4 — 32
15

32 — sand w/ pebbles & small cobbles 10YR 6/4 — 34
16

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

TIMELINES INC.

Boring Record

Date 10-15-91 | Page 3 of 3

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 11SB-4 (18) | Geo. Tech. Eng. | Driller

Sample#	Depth	Description
17	34–36	sand w/ pebbles 10YR6/4
18	36–38	sand w/ pebbles 10YR5/4
19	40–42	course to fine sand w/pebbles 10YR 4/4 – 4/2 water
20	45–47	sand 10YR4/2
21	50–52	sand 10YR5/4
22	55–57	sand 10YR5/4
23	60–62	no recovery – bone jammed in augur

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

31/57

TIMELINES INC.

Boring Record

Date 10-26-91 | Page 1 of 3

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 13SB-1 (33) | Geo. Tech. Eng. | Driller

Sample# 1 — 0 — Humus — .8 — sandy loam w/ pebbles, gravel & coal; 10YR3/2

Sample# 2 — 2 — Fill — 3.6 — sand w/ pebbles & gravel; 10YR6/6

Sample# 3 — 4 — Natural, Disturbed ? — 5.4 — sand, cobble frags., pebbles; 10YR6/4

Sample# 4 — 6 — 7.6 — compacted course sand w/ pebbles, cobble frags.; 10YR 7/1 - 6/4

Sample# 5 — 8 — 9.3 — compacted course sand w/ pebbles & cobble frags.; 10YR 7/1 - 6/4

Sample# 6 — 10 — 12 — compacted sand w/ pebbles & cobble frags.; 10YR 6/1-4

Sample# 7 — 12 — 13.9 — compacted sand w/ pebbles & cobble fragments; 10YR 6/3

Sample# 8 — 14 — 15.7 — course sand w/ pebbles; 10YR6/3

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-26-91 | Page 2 of 3

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 13SB-1 (33) | Geo. Tech. Eng. | Driller

Depth	Description	Sample#
16 – 17.4	course sand w/ pebbles, cobble frags. 10YR6/3	9
18 – 19.3	course sand w/ pebbles, cobble frags. 10YR6/4	10
20 – 21.7	med to course sand w/ pebbles, cobble frags, 10YR6/4	11
22 – 23.2	course sand w/ pebbles and cobble frags, 10YR6/3	12
24 – 25.5	med. sand w/ pebbles, cobble frags, 10YR6/4	13

Depth	Description	Sample#
26 – 27 – 28	course sand w/ pebbles and cobble frags concent. in lower 1.0' 10YR5/3	14
28 – 29.1	course sand w/ pebbles, cobble frags, 10YR 6/1 - 5/3	15
30 – 31.2	course sand w/ cobble frags, pebbles lower .4' wet 10YR5/4	16

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 10-26-91 | Page 3 of 3

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMC

Boring # 13SB-1 (33) | Geo. Tech. Eng. | Driller

32

wet
course sand
w/pebbles &
cobble frags.
10YR5/4

32.4

wet
siltysand
10YR5/3

36

Sample# 17 ---- ---- ---- ----

Sample# ---- ----

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

32

TIMELINES INC.

Boring Record

Date 10-16-91 — Page 1 of 2

Project Watertown Arsenal — Spoon Diameter 2.5" — Recorded by JPMc

Boring # 13SB-2 (19) — Geo. Tech. Eng. ____ — Driller ____

Sample # 1

Depth	Unit	Description
0 – .4	humus	sandy loam 10YR 3/2
.4 – .6	fill	sandy loam 10YR 5/6
.6 – 1.6	fill	loamy sand w/pebbles, gravel, & ash 10YR 5/3

Sample # 2

Depth	Unit	Description
2 – 2.3	fill	sand, pebbles, & gravel & 10YR 7/3

Sample # 3

Depth	Unit	Description
4 – 4.5	fill	loamy sand w/ pebbles 10YR 3/4
4.5 – 6	fill	sand, pebbles, & gravel 10YR 6/4

Sample # 4

Depth	Unit	Description
6 – 6.9	fill	sand, pebbles, & gravel 10YR 6/4

Sample # 5

no recovery
hit rock - augured down through cobbles

Sample # 6

Depth	Unit	Description
10 – 11.2	natural	course sand w/pebbles 10YR 5/4

Sample # 7

Depth	Unit	Description
12 – 14		course sand w/pebbles 10YR 6/6

Sample # 8

Depth	Unit	Description
14 – 14.7		course sand w/pebbles 10YR 4/4
14.7 – 15		med. sand w/
15 –		pebbles 10YR 5/4

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

TIMELINES INC.

Boring Record

Date 10-16-91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 13SB-2 (19) Geo. Tech. Eng. ____ Driller ____

Sample#	Depth	Description
9	16 – 16.4	med. sand w/ pebbles 10YR5/4
	16.4 – 17.2	course sand w/ pebbles 10YR6/3
10	18 – 19.3	sand and pebbles 10YR6/3
11	20 – 21.5	sand & pebbles 10YR6/3
12	22 – 22.9	sand & pebbles 10YR6/3
	22.9 – 23.2	very fine wet sand 10YR5/3
13	24 – 26	very fine wet sand 10YR5/3

Sample# -- ---- ----

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

33

TIMELINES INC.

Boring Record

Date 10-11-91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 13SB-3 (8) Geo. Tech. Eng. Driller

0
humus
.5
sandy loam w/ gravel 10YR 3/2

Sample# 1

2
fill
Sandy loam w/gravel 10YR 3/3
3.8
fill
4
sandy loam 10YR 4/3

2

4
fill
sandy loam 10YR 3/2
4.5
fill
sandy loam w/ pebbles 10YR 6/2-5/3
6

3

6
natural
Sand w/ pebbles & cobbles 10YR 7/2-6/2
8

4

8
no recovery - augured through cobbles in sandy silt

5

15
no recovery augured through cobbles in sandy silt

Sample# 6

17
sandy silt in course sand 10YR 5/2-6/3
17.4
bedded sands 10YR 6/3-7/2
18

7

19
bedded sands 10YR 6/3-7/2
21

8

J--Judgmental Unit
S--Systematic Unit
X--Artifact
Key

TIMELINES INC.

Boring Record

Date 10-11-91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 13SB-3 (8) Geo. Tech. Eng. Driller

21

bedded sand 10YR6/3-7/2-6/4

23

23

bedded silty sand 10YR 6/4

25

Sample# 9 10

Sample#

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

34/55

TIMELINES INC.

Boring Record

Date 10-25-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 14SB-1 (30) Geo. Tech. Eng. ________ Driller ________

Sample # 1
0 – humus – fine loamy sand 10YR6/3
.3 – fill – loamy sand w/gravel & ash 10YR3/3
.9

Sample # 2
2 – no recovery, – rock in spoon tip
4

Sample # 3
4 – fill – loamy sand w/gravel, ash, coal & brick fragments 10YR 2/1-3/2
4.6

Sample # 4
6 – fill – loamy sand w/gravel, coal 10YR3/1
6.3 – disturbed ? – silty sand w/pebbles 10YR5/3
6.7

Sample # 5
8 – fill – silty sand w/pebbles & coal 10YR3/1
8.4 – fill ? – silty sand w/pebbles 10YR5/4
9.2

Sample # 6
10 – fill ? – silty sand w/pebbles 10YR 5/3-7/1
10.4 – fill – silty sand, ash, cinders 10YR 3/1
10.6 – natural – silty sand w/pebbles 10YR 5/3
10.7

Sample # 7
12 – silty sand w/pebbles & cobble fragments 10YR 5/3
12.5

Sample # 8 & 9
14 – moist fine sand 10YR6/4
15.2
16 – wet fine sand 10YR6/4
18

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

35/59

TIMELINES INC.

Boring Record

Date 10-26-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 15SB-1 (31) Geo. Tech. Eng._____ Driller_____

Sample# 1

0 Humus .2 — sandy loam w/pebbles & bricks 10YR 3/2

Fill .8 — loamy sand w/pebbles & gravel 10YR 5/6

Sample# 2

2 Fill — coal w/silty sand 10YR 2/1

2.7 Natural 2.9 — course silty sand w/ pebbles 10YR 5/6

Sample# 3

4 — No Recovery

Sample# 4

6 — wet, No Recovery

Sample# 5

8 — wet silty sand 10YR 6/1 - 5/6

9.4

Sample# __ ____ ____

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

36

TIMELINES INC.

Boring Record

Date 10-26-91 | Page 1 of 1

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # 155 B-2 (32) | Geo. Tech. Eng. | Driller

Depth	Unit	Description
0	Humus	fine loam 10YR 3/3
.4	Fill	loamy sand w/gravel, coal & ash 10YR 2/1-3/2
1.6		

Sample# 1

Depth	Unit	Description
2		No Recovery

Sample# 2

Depth	Unit	Description
4	Fill	moist loamy sand w/gravel 10YR 2/2
4.3	Natural	wet silty sand 10YR 5/4
5.8		

Sample# 3

Sample#

Sample#

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

37

TIMELINES INC.

Boring Record

Date 10-24-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 17SB-1 (25)

Geo. Tech. Eng.

Driller

second surface sample

Sample#	Depth / unit	Description
1	0 humus .2	sandy loam 10YR 3/2
	.2 fill ? .8	loamy sand w/gravel 10YR 4/4
2	0 humus .2	sandy loam 10YR 3/2
	.2 fill ? 1.2	loamy sand w/gravel 10YR 4/4
3	2 fill 2.6	loamy sand w/gravel, ash & cinders 10YR 3/2
4	4 – 6	Trace recovery only, wet
5	6 fill 6.3	loamy sand w/gravel & brick frag. 10YR 3/2
	6.3 natural 6.4	fine clay 5Y 5/1
	6.4 – 7.2	fine silty clay 10YR 4/1

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

38

TIMELINES INC.

Boring Record

Date 10-24-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # 17SB-2(24)

Geo. Tech. Eng.

Driller

0
humus
.2 sandy loam 10YR 4/3
fill loamy sand & ash w/ gravel
1.3 10YR 3/2 - 2/1

2
fill loamy sand and ash w/ sm. gravel 10YR 3/1
3.6

4
fill sand & ash w/ gravel 10YR 3/1
5.4

6 wet
fill sand & ash w/ gravel & a brick fragment 10YR 3/1
6.6
natural silty clay w/ organics 10YR 3/2
7.2

8 silty clay 10YR 3/2 - 4/1
10

Sample# 1 2 3 4 5

Sample# -- ---- ----

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

39

TIMELINES INC.

Boring Record

Date 10-28-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # 18SB-1 (42) Geo. Tech. Eng. Driller

* augured through macadam .5'

Sample# 1

Depth	Unit	Description
.5–1.0	Fill	sand w/ gravel 10YR6/4
1.0–1.4	Fill	fine sandy loam w/ pebbles 10YR 3/3

Sample# 2

Depth	Unit	Description
2–2.4	Fill	sand w/ gravel 10YR 5/6
2.4–2.8	Fill	silt and fine sand 10YR6/3

Sample# 3

Depth	Unit	Description
4–5.2	Fill	silt and fine sand 10YR 6/3

Sample# 4

Depth	Unit	Description
6–6.4	Fill	silt and fine sand 10YR6/3
6.4–6.8	Fill	silty sand w/ pebbles 10YR 5/6

Sample# 5

Depth	Unit	Description
8–8.7	Fill	silty sand w/ pebbles 10YR 5/2

Sample# 6

Depth	Unit	Description
10–10.6	Fill	silty clay 10YR5/2
10.6–10.8	Fill	sandy loam w/ coal 10YR3/2

Sample# 7

Depth	Unit	Description
12–12.3	Fill	loamy sand w/ gravel 10YR4/2
12.3–12.9	Natural	fine sand and clay 10YR 5/4

Sample# 8

Depth	Unit	Description
14–16		wet sand and clay 10YR 5/4

Key

J--Judgmental Unit X--Artifact
S--Systematic Unit

40

TIMELINES INC.

Boring Record

Date 10-24-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMC

Boring # 17SB-3(26)

Geo. Tech. Eng.

Driller

0
humus sandy loam 10YR 3/2
.2
fill loamy sand w/gravel, brick frags, & coal frags. 10YR 2/2
.9

Sample# 1

2
fill silty sand w/gravel
2.7

Sample# 2

4
fill silty sand w/gravel, pebbles, brick frags, & coal frags. 10YR 5/4–6/6
6.

Sample# 3

6
disturbed ? silty sand w/gravel, pebbles, cobble frags, and brick frags. 10YR 6/4
7.8

Sample# 4

8
moist
natural silty clay 10YR 3/2
8.4

Sample# 5

10
moist silty clay 10YR 3/1
10.6

Sample# 6

12
moist silty clay 5Y 3/1
12.3

Sample# 7

14
bedded silty & sandy clay 5Y 4/1
16

Sample# 8

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

41

TIMELINES INC.

Boring Record

Date 10-27-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMC

Boring # GRSB-1 (34)

Geo. Tech. Eng.

Driller

Sample# 1

0 Humus: sandy loam 10YR 3/2
.5 Fill: loamy sand w/pebbles & gravel 10YR 5/3
1

Sample# 2

2 Fill: loamy sand w/pebbles & gravel 10YR 5/3
2.6

Sample# 3

4 Fill: loamy sand w/pebbles & gravel 10YR 5/3
5.3

Sample# 4

6 wet, No Recovery

Sample# 5

8 Natural: wet loamy silt 10YR 2/1 & silty sand 5Y 5/1 – 2.5Y 6/6
9.2

Sample#

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

42

TIMELINES INC.

Boring Record

Date 10-27-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # GRSB-~~2~~ (3B)

Geo. Tech. Eng.

Driller

* augured through macadam and concreate -.7'

Sample# 1
- .7 – Fill – silty sand w/gravel & pebbles, 10YR3/3
- 1.2 – Fill – sand w/ pebbles 10YR5/6
- 1.8

Sample# 2
- 2 – Natural – sand w/ cobble fragments and pebbles 10YR6/3
- 3.4

Sample# 3
- 4 – sand w/ pebbles & cobble frags. 10YR6/3
- 5.7 – fine silty sand & clay 10YR5/4
- 6

Sample# 4
- 6 – silty sand 10YR 5/4
- 6.3 – sand w/ pebbles & cobble frags. 10YR6/3
- 7.5

Sample# 5
- 8 – silty sand & clay 10YR 5/4-6
- 8.4 – sand w/ pebbles & cobble frags.
- 9.2 – 10YR7/2-6/3

Sample# 6
- 10 – sand w/ pebbles & cobble frags. 10YR7/3-7.5YR5/4
- 11.2

Sample# 7
- 12 – wet sand w/ pebbles & cobble frags 10YR5/4
- 13.1

Sample# ----
- 14 – wet sand w/pebbles & cobble frags 10YR6/3
- 15.2

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

43

TIMELINES INC.

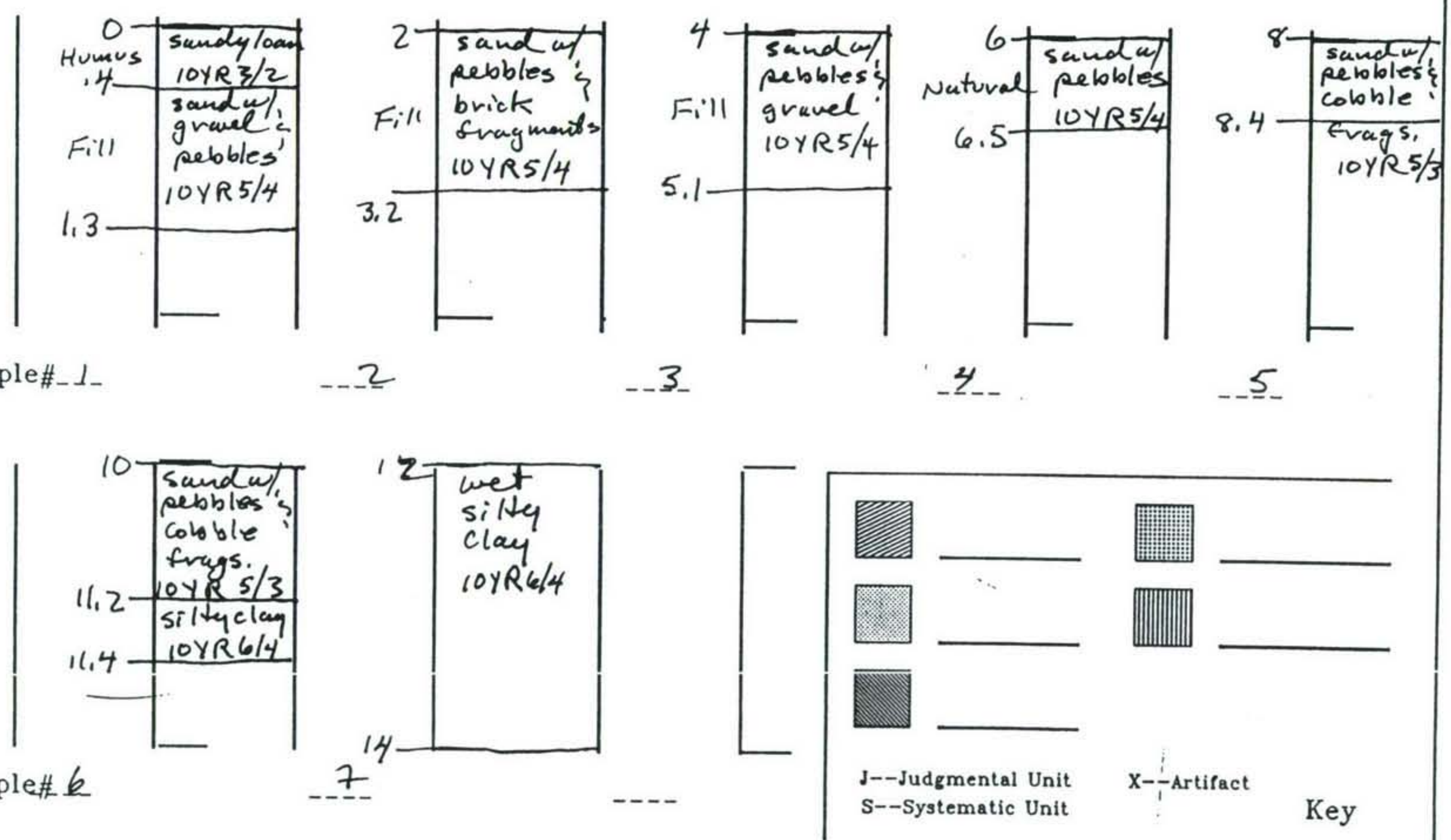
Boring Record

Date 10-27-91

Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # GRSB-3 (34) Geo. Tech. Eng. ____ Driller ____



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TIMELINES INC.

Boring Record

Date 10-27-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # GRSB-5 (36) Geo. Tech. Eng. Driller

Sample# 1

0 — Humus — fine sandy loam 10YR3/2
.5 — Fill — course sand 10YR5/2
.6

Sample# 2 * wire nail

2 — Fill * — sand, cement, brick frags, 10YR6/2
2.7

Sample# 3

4 — Fill — sandy gravel 10YR5/3
4.6

Sample# 4

6 — Fill — brick frags, sand & gravel 10YR6/2
6.9

Sample# 5

8 — Fill — silty sand, 10YR 3/3 w/pebbles & brick frag.
8.2 — Natural — sandy pebbles 10YR6/2
8.7

Sample# 6

10 — moist silty clay 2.5YR5/2
11.2

Sample# 7

12 — wet silty clay & sandy silt 2.5YR5/2
13.6

Sample# ----

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

46

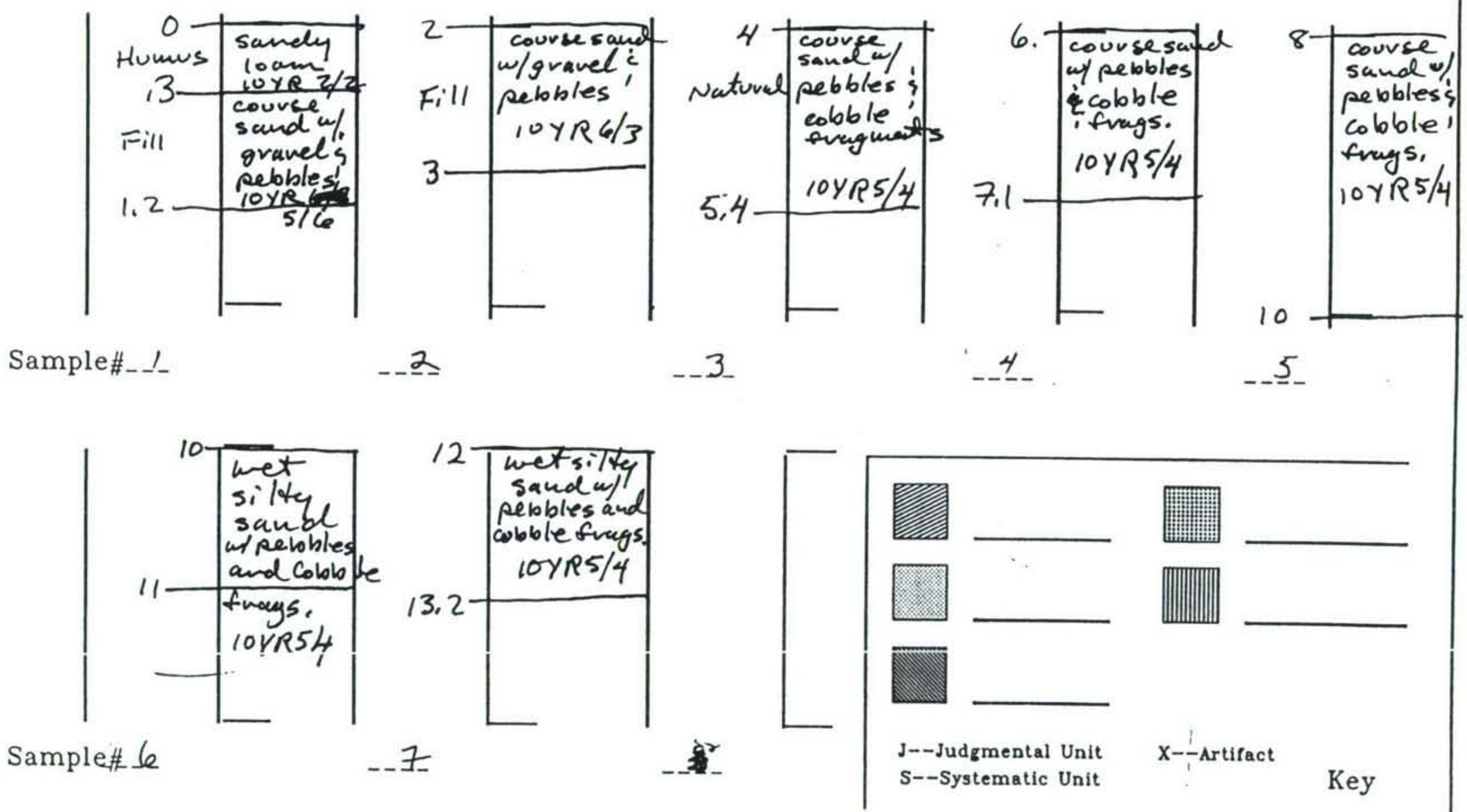
TIMELINES INC.

Boring Record

Date 10-27-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # GRSB-6 (37) Geo. Tech. Eng. Driller



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TIMELINES INC.

Boring Record

Date 10/30/91

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Project Watertown Arsenal

Spoon Diameter 2 1/2 in

Recorded by E. Décima

Boring # GRSB-7-0

Geo. Tech. Eng. WESTON

Driller R & R

DEPTHS in FEET

CEMENT SURFACE - ROAD

Sample #	Depth	Description
1	0 – 1.1 – 2	1.1: yell. brown/ light red. brown silty sand some gravel brick frag + asphalt frags (5/4 10YR)
2	2 – 4	No Recovery
3	4 – 4.4 – 6	4.4: Dk brown silty loam. Yell. w br. (some greyish) silty sand. More gravel (5/3 10YR)
4	6 – 7 – 8	7: 6/4 10YR very gravelly med/coarse sand. All of these sed. could be fill
5	8 – 10	Coarse sand, from yell. br. to reddish br. to lt. grey - lots of gravel around 6/4 10YR
6	10 – 10.6 – 12	10.6: Yell. br. Coarse sand lots of gravel.
7	12 – 12.8 – 14	12.8: wet med/ coarse yell br sand (6/3 10YR). Gravelly
8	14 – 16	wet med/coarse sand (some small gravel) Clayey silt/ silty clay dk olive br. 4/2 to 5/2 2.5Y

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

48

TIMELINES INC.

Boring Record

Date 10/30/91

Page 1 of 1

Project: Watertown Arsenal

Spoon Diameter 2 1/2 in

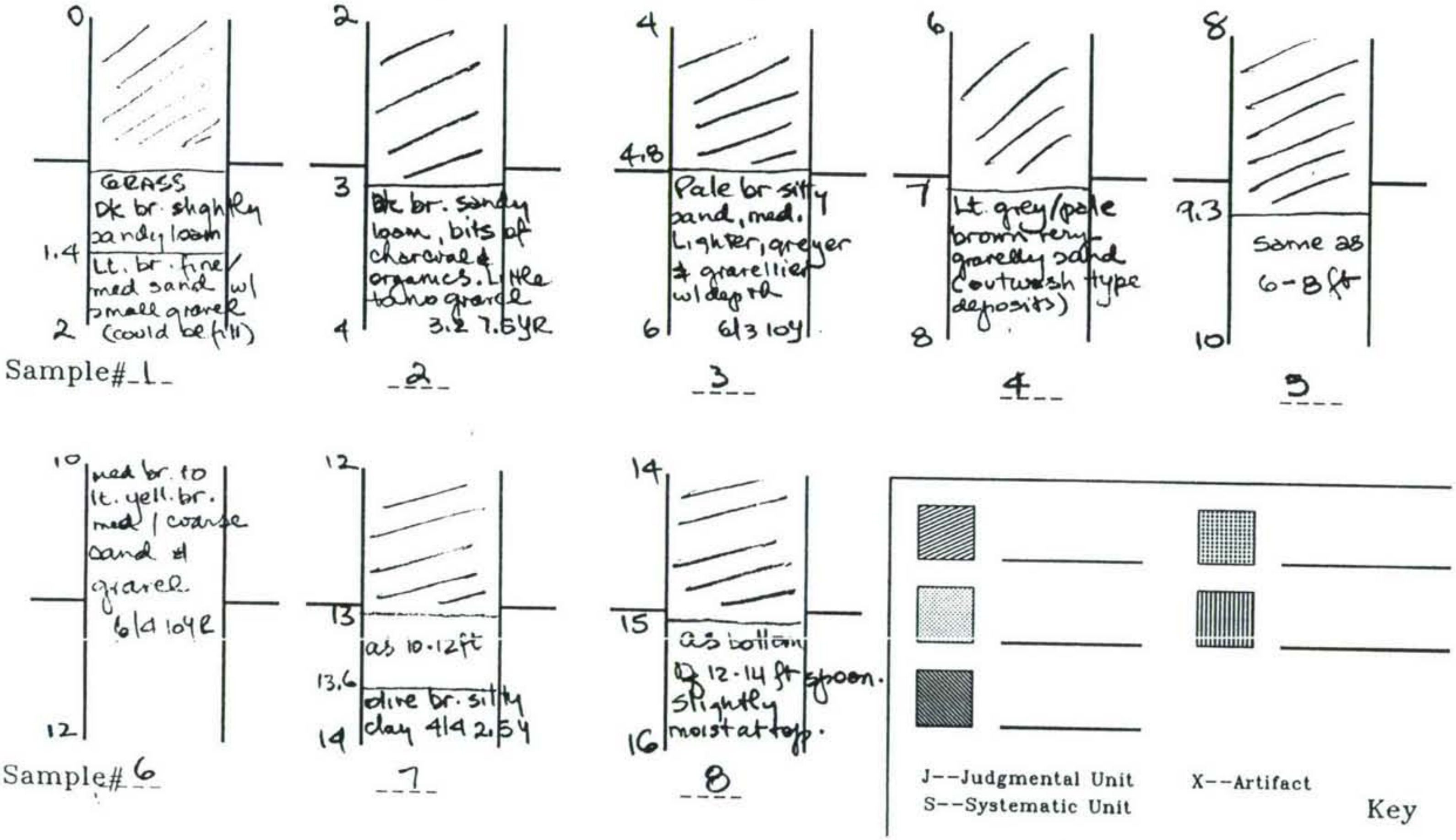
Recorded by E. Décima

Boring # GRSB-8-0

Geo. Tech. Eng. Weston

Driller R&R

all depths in feet! Grass surface



49

TIMELINES INC.

Boring Record

Date 10/30/91

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Project: Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by E. Decima

Boring # 6RSB-9-0 Geo. Tech. Eng. Weston Driller R&R

all depths in feet Concrete SURFACE

Sample#	Depth (ft)	Description
1	0–2	1.4: Lt. yell. br sandy silt, no gravel. 5.4 2.5Y; 1.8–2: very dk br. sandy silt, some gravel. 2/2 10YR
2	2–4	No RECOVERY
3	4–6	No Recovery
4	6–8	No Recovery
5	8–10	CORING STOPPED. Employee informed drillers that a tunnel with weather instruments, wires, etc. exists in area of soil boring.

Sample# __ ---- ----

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

50

TIMELINES INC.

Boring Record

Date 10/30/91

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Project, Watertown Arsenal Spoon Diameter 2½ in Recorded by E. DeCima

Boring # GRSB-10 Geo. Tech. Eng. Weston Driller R&R

all depths in feet

CONCRETE SURFACE

Sample# 1 (0–2)
0
1.2 med. br./yell. br (5/4 10YR) sandy soil some small gravel
2

Sample# 2 (2–4)
2
3 Lt. yell br (6/4 10YR) med/fine sand w/ small gravel
4

Sample# 3 (4–6)
4
4.7 Lt med br. to lt. yell. br., some gray (5/4 10YR) med/fine sand larger gravel
6

Sample# 4 (6–8)
6
7 Lt. olive br (5/4 2.5Y) med/coarse sand. Smaller gravel
8

Sample# 5 (8–10)
8
8.3 as 6-8 ft. spoon
9 Lt yell. br., moist med/coarse sand - small gravel
9.5 Lt pale brown fine sand No gravel 6/4 2.5Y
10

Sample# 6 (10–12)
10
10.8 as bottom of 8-10 spoon
11.4 Med dk br. med/fine sand (some silt) w/ gravel
12

Sample# 7 (12–14)
12
12.5 olive br. med. sand w/ gravel 6/4 2.5Y More gravel with depth
14

Sample# 8 (14–16)
14
14.6 yellowish br. (5/4 10YR) to Lt. olive br (5/6 2.5Y) fine, slightly moist sand No gravel
16

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

51

TIMELINES INC.

Boring Record

Date 10-25-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # GR SB-11 (27)

Geo. Tech. Eng.

Driller

* augured through .5' of macadam

Depth	Unit	Description
.5 – .9	humus ?	loamy silt 10YR 3/1
2 – 2.4	fill	silty sand, w/ gravel & pebbles 10YR 5/4
4 – 4.3	disturbed ?	wet silty sand w/ gravel & pebbles 10YR 5/4
6 – 6.8	natural	wet silty sand w/ pebbles 10YR 5/4

Sample# 1   2   3   4

Sample#

J--Judgmental Unit
S--Systematic Unit

X--Artifact

Key

51

TIMELINES INC.

Boring Record

Date 10-28-91 | Page 1 of 1

Project Watertown Arsenal | Spoon Diameter 2.5" | Recorded by JPMc

Boring # GRSB-12 (41) | Geo. Tech. Eng. | Driller

Depth	Unit	Description
0 – .4	Humus	sandy loam 10YR 3/3
.4 – .8	Fill	loamy sand 10YR 4/2
.8 – 1.1	Fill	sand and gravel 10YR 5/3
1.1 – 1.3	Natural	silty sand and clay 10YR 6/3

Sample# 1

2 – 4: moist silty sand & clay 10YR5/3

Sample# 2

4 – 6: wet silty sand & clay 10YR6/3

Sample# 3

6 – 8: wet silty sand & clay 10YR6/3

Sample# 4

Sample# --

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

TIMELINES INC.

Boring Record

Date 10/30/91 Page 2 of 3

Project Watertown Arsenal Spoon Diameter 2½ in Recorded by E. DeLima

Boring # 6298-10 Geo. Tech. Eng. Weston Driller R&R

Sample# 9 (16–18)
16
16.2 — same as 14-16 spoon.
lt. olive br (5Y 6 2.5/4) med sand w/ gravel Dry
18

Sample# 10 (18–20)
18
18.8 — dk yell. br (10YR 4/4) med/coarse sand some small gravel
20

Sample# 11 (20–22)
20
21 — Dk yell. br. mottled w/ reddish & grey bits (from pebbles) med/coarse sand. Very gravelly
22

Sample# 12 (22–24)
22
23.3 — same as 20-22 spoon
24

Sample# 13 (24–26)
24
24.8 — Med brown with reddish & grey mottles med/coarse sand slightly silty lots of gravel
26

Sample# 14 (26–28)
26
27 — same as 24-26 spoon
28

Sample# 15 (28–30)
28
29.5 — same as 24-26 spoon
30
Rock at bottom of spoon

Sample# 16 (30–32)
30
31 — Same as 24-26 spoon
32

Key

J--Judgmental Unit
S--Systematic Unit
X--Artifact

3

TIMELINES INC.

Boring Record

Date 10/30/91

Page 3 of 3

Project MTL

Spoon Diameter 2 1/2 in.

Recorded by E. Decima

Boring # GRSB-10

Geo. Tech. Eng. Weston

Driller R&R

32

32.6

Lt/med olive br fine silty sand No gravel

33.6

Dk med br/dk yell br med sand No gravel

34

Sample# 17

34

35

Dk yellowish br. wet med/fine sand No gravel

36

18

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

[redacted] 53

TIMELINES INC.

Boring Record

Date 10/31/91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by SD

Boring # GR SB-13 Geo. Tech. Eng. Weston Driller R & R

all depths in feet - Concrete surface.

Sample# 1 (0–2)
1.1 Mostly med. sand, no gravel. Concrete Brick at 1.5 ft B.S. (old brick floor?).

Sample# 2 (2–4)
3.4 Concrete frags Bricks, some with mortar

Sample# 3 (4–6)
4.9 Fill, concrete frags, stones Wash on top

Sample# 4 (6–8)
7.3 Pure gravel
med. yellow brown med/coarse sand

Sample# 5 (8–10)
9.2 Dk brown sandy soil w/gravel
Lt. yell. brown coarse sand + tr. of gravel

Sample# 6 (10–12)
10.8 Med yellow brown med/coarse sand (traces of silt) Gravel

Sample# 7 (12–14)
12.6 Same as 10.12 Jgoon

Sample# 8 (14–16)
13.4 Light yell. brown med fine sand Little gravel

Key

J--Judgmental Unit X--Artifact
S--Systematic Unit

TIMELINES INC.

Boring Record

Date 10/31/91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by SD

Boring # 6R SB-13. Geo. Tech. Eng. Weston Driller R & R

Sample#	Depth (ft)	Description
9	16 – 16.7	
	16.7 – 18	med. yell. br. med. sand Little/no gravel Lighter at bottom.
10	18 – 19.2	
	19.2 – 20	Lt. yell. br. med/fine sand. Little/no gravel. Red at bottom, mineralized. (H₂O activities)
11	20 – 22	olive br. med/fine sand Traces of silt
		Dk med. br. med/fine sand.
		Black oil soaked med/fine sand
		med/dk. grey oil soaked med/fine sand (bluish tint)
12	22 – 24	Bluish grey fine sand. Top 1 ft mottled w/ black/dk brown from oil sipping.

Sample# ---- ---- ----

Sample# ---- ----

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

54

TIMELINES INC.

Boring Record

Date 11/1/91

Project Watertown Arsenal

Spoon Diameter 2 1/2 in

Recorded by RD

Page 1 of 2

Boring # 61C3B15

Geo. Tech. Eng. Weston

Driller R.A.R.

all depths in feet.

Sample# 1
0 – 2
1 Grass + loam 2/2 10YR Very dk greyish brown sandy soil Lots of gravel Fill? 3/1 10YR

Sample# 2
2 – 4
3.2 6/4 10YR Sandy soil w/gravel
yellowish grey brown sand + gravel

Sample# 3
4 – 6
5.2 6/4 10YR Coarse/med yell. br. sand + gravel

Sample# 4
6 – 8
7 Same as 4-6 spoon.

Sample# 5
8 – 10
9.1 Lt yell. br. sandy silt w/ gravel (large stones). 5/4 10YR.

Sample# 6
10 – 12
10.5 Same as 8-10 spoon very gravelly, sandier. [illegible] sand.

Sample# 7
12 – 14
12.7 6/2 10YR Lt brownish grey med/fine sand & gravel (less than above) sand getting finer - sl. damp.

Sample# 8
14 – 16
14.2 Med sand some gravel 6/4 10YR
Bottom mottled w/ organic-looking silty dk grey (4/1 10YR) chunks - compact
Very fine, very pale grey (7/1 10YR) whitish grey sand - clean
as top without mottling.

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

TIMELINES INC.

Boring Record

Date 11/1/91

Project Watertown Arsenal

Boring # GESB-15

Spoon Diameter 2 1/2 in

Geo. Tech. Eng. Weston.

Page 2 of 2

Recorded by GP

Driller R&R

Sample#	Depth	Description
9	16 – 16.7 – 18	Lt yellowish brown (6/4 10YR) med sand. Little/no gravel. Sl. humid
10	18 – 20	med/fine sand. Little to no gravel. Grey brown 6/3 10YR. Finer, lighter at bottom
11	20 – 20.4 – 22	Top 0.5 ft as 18-20 spoon. At 21 ft coarser reddish yellow (6/4 10YR). Bottom mostly gravel w/ some sand within it (6/2 10YR Lt br grey)
12	22 – 22.9 – 24	Pale brown med/fine sand, traces of gravel. 6/3 10YR. Moist at bottom.
13	24 – 24.7 – 25.8 – 26	as 22-24 spoon. Coarse greyish brown (5/2 10YR) sand. Small gravel. Mostly gravel. Mottled greyish br., bright orange + grey coarse sand.
14	26 – 28	med/dk yellow br (5/4 10YR) med/coarse sand. One 6-7 stone.
15	28 – 28.4 – 30	Dk yellowish brown med/coarse sand w/ gravel. Slightly humid. 4/4 10YR
16	30* – 30.9 – 32	Wet med. yell br. fine sand. 5/4 2.5YR (lt. olive br.) No gravel

Key

J--Judgmental Unit

S--Systematic Unit

Y--Artifact

* Spoon broke at 30 ft B.S. - Dug parallel to 1st hole

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TIMELINES INC.

Boring Record

Date 11/6/91

Page 1 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by ED

Boring # WRSB17 Geo. Tech. Eng. Weston Driller RAR

all depths in feet

Sample# 1 (0–2): 0; 0.8 very dk br. 3/3 10YR silty loam; 1.2 Dk yell. br (3/4 10YR) gravelly coarse sand. Trace of silt; 2.

Sample# 2 (2–4): 2; 2.8 Lt. yell. brown (4/6 10YR) very gravelly med/coarse sand large stones; 4

Sample# 3 (4–6): 4; 5 Same as 2-4 spoon. slightly more greyish.; 6

Sample# 4 (6–8): 6; 7.1 Lt yell. br. 6/4 10YR med sand, very gravelly. Sand looks multi-~~color~~ due to breakage lot of stones, Many slatey stones!; 8

Sample# 5 (8–10): 8; 8.8 Same as 6-8 spoon; 10

Sample# 6 (10–12): 10; 10.7 5/6 10YR same as 8-10 spoon Gravel less coarse; 12

Sample# 7 (12–14): 12; 13.1 5/4 10YR as 10-12 spoon Not as many stones.; 14

Sample# 8 (14–16): 14; 15.8 Same as 12-14 - Less gravel; 16

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

TIMELINES INC.

Boring Record

Date 1/6/91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in. Recorded by SP

Boring # GRSB 17 Geo. Tech. Eng. Weston Driller R&R

16–18
16
16.9 Same as 14-16 spoon.
18

18–20
18
18.2 Same as 16-18 spoon.
19.1 6/3 10YR (Pale br.) fine/med sand quite clean
19.5 6/3 10YR med sand, more gravelly.
20

20–22
20
20.3 4/4 2.5Y (olive br) gravelly sand.
20.8 5/4 2.5Y (Lt. ol. br) very fine sand Cross bedding microstratigraphy. some 1mm or less, some rusty color. No gravel
22

22–24
22
22.7 as bottom of 20-22 sp. but wet
23 MOIST, same color, fine / very fine sand bedded all the way. No gravel. Microlayers ≤1mm. sl. darker brown than matrix
24

24–26
24
24.8 6/4 2.5Y Very fine sand Not as bedded No gravel.
26

Sample# 9 ---- 10 ---- 11 ---- 12 ---- 13

26–28
26
26.4 as above.
26.6 4/4 2.5Y olive br. silty clay No gravel
28

28–30
28
28.1 wet, med ol. br. silty clay as above
29.2 lt. yell. brown 4/6 10YR med sand. Humid Some small gravel
30

30–32
30
30.4 5/4 2.5Y Lt. ol. br. fine sand moist
31.5 4/4 2.5Y med/fine sand Humid
32

Sample# 14 ---- 15 ----

Key

J--Judgmental Unit X--Artifact
S--Systematic Unit

58

TIMELINES INC.

Boring Record

Date 10-25-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter: 2.5" Recorded by JPMc

Boring # GRSB-19 (29) Geo. Tech. Eng. Driller

Sample# 1

0 humus — fine sandy loam w/ gravel 10YR 3/2
.5 fill — course loam sand w/ gravel 10YR 4/2
.9

Sample# 2

2 fill — fine sandy loam 10YR 2/2
2.2 fill — coal ash in loamy sand 10YR 2/1
2.4 fill — course loamy sand w/ gravel & brick frags. 10YR 5/3
3 — augured through cobbles

Sample# 3

5 natural — sandy loam 10YR 3/2 *
5.7 — loamy sand w/ pebbles & cobble fragments 10YR 6/2-7/1
6.4

* styrofoam fragment at top of sample

Sample# 4

7 — silty sand w/ pebbles 10YR 5/4
7.4 — moist silty clay 10YR 2/1
7.8

Sample# 5

9 — no recovery wet
11

retry

Sample# 6

9 — wet silty clay 10YR 2/1
11

Sample# ----

Sample# ----

J--Judgmental Unit X--Artifact
S--Systematic Unit

Key

60

TIMELINES INC.

Boring Record

Date 11/6/91

Page 1 of 2

Project Watertown Arsenal

Spoon Diameter 2 1/2 in

Recorded by JD

Boring # GRSB 21

Geo. Tech. Eng. Weston

Driller R & R

all depths in feet

Sample#	Depths (ft)	Description
1	0 – 0.7 – 2	Dk br. silty loam – a few (2/3) rel. small brick frags.
2	2 – 3. – 3.5 – 4	4/6 7.5YR (strong br.) loam; 6/3 10YR Pale br. med sand w/ gravel
3	4 – 4.7 – 6	color as above med/coarse sand w/ gravel
4	6 – 7.8 – 8	Same as 4-6 spoon
5	8 – 10	Lt. gr. br. med/coarse sand. Gravel; med. yell. br. med/coarse sand. smaller gravel
6	10 – 11 – 12	Lt. yell br. (6/4 10YR) silty sand; pale greyish br. med/coarse sand. Gravel
7	12 – 12.9 – 14	no 12-12 spoon
8	14 – 14.6 – 15.8 – 16	6/4 10YR med/coarse sand + gravel; 7/2 10YR Fine/very fine sand.

Key

J--Judgmental Unit

S--Systematic Unit

X--Artifact

TIMELINES INC.

Boring Record

Date 11/6/91

Page 2 of 2

Project Watertown Arsenal Spoon Diameter 2 1/2 in Recorded by JD

Boring # Col. SB 21 Geo. Tech. Eng. Weston Driller R & R

Sample#	Depth	Description
9	16–17	
	17–17.6	Pale brown fine sand
	17.6–17.7	Red dk br.
	17.7–17.8	5/2 10YR Grav. sand — lens broken stone + sand
	17.8–18	6/3 10YR Red fine sand - some gravel
10	18–18.5	
	18.5–19	5/6 10YR yell br. fine/v. fine sand
	19–19.8	Grayish yell. br. (5/4 10YR) med sand, gravelly
	19.8–20	5/4 2.5Y Lt ol. br. fine sand
11	20–20.6	
	20.6–22	Lt yellowish br. (6/4 2.5Y) fine sand. Fine bedding (darker) in some areas.
12	22–22.6	
	22.6–23.3	6/3 10YR Pale br. fine/med sand
	23.3–24	6/6 2.5Y olive yellow med/fine sand. Lens of coarser sand at bottom
13	24–24.6	
	24.6–26	Wet fine sand. 6/6 2.5Y

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

61

TIMELINES INC.

Boring Record

Date 10-28-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # GRSB-22 (43) Geo. Tech. Eng. ____ Driller ____

Sample# 1

0
Humus: sandy loam 10YR3/2
0.4
Fill: silty sand w/gravel & pebbles 10YR5/3
1.3

Sample# 2

2
NO Recovery

Sample# 3

4
NO Recovery

Sample# 4

4
Fill *: wet silty ~~clay~~ sand, ash, gravel 10YR3/1
5
Natural: wet silty clay 5Y3/1
7

Sample# ____

* clear glass fragment

J--Judgmental Unit
S--Systematic Unit
X--Artifact

Key

62

TIMELINES INC.

Boring Record

Date 10-25-91

Page 1 of 1

Project Watertown Arsenal

Spoon Diameter 2.5"

Recorded by JPMc

Boring # GRSB-23 (28)

Geo. Tech. Eng.

Driller

Depth	Unit	Description
0 – .4	humus	sandy loam 10YR 3/3
.4 – .8	fill	loamy sand w/gravel, coal, ash, &
.8		brick frags 10YR 5/4

Sample# 1

Depth	Unit	Description
2 – 2.45	fill	silty sand w/ ash * 10YR 2/1

Sample# 2

* sm. unidentified fully iron fragment - oxidated

Depth	Unit	Description
4 – 5.4	fill	wet silty sand, gravel, & ash, w/ brick & coal frags. 10YR 2/1 - 5/4

Sample# 3

Sample#

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

63

TIMELINES INC.

Boring Record

Date 10-28-91 Page 1 of 1

Project Watertown Arsenal Spoon Diameter 2.5" Recorded by JPMc

Boring # GRSB-24 (40) Geo. Tech. Eng. Driller

*augured through macadam & rock - 2'

Sample#	Depth	Unit	Description
1	2 – 3.6	Fill	silty sand w/pebbles gravel & brick fragments 10YR4/2
2	4		No Recovery
3	5 – 5.6	Fill	fine sand w/pebbles and gravel 10YR5/1
4	6 – 7.3	Fill	sand w/pebbles & gravel 10YR5/1 - 5/3
5	8 – 8.8	Natural	peaty silt 10YR3/3
6	10 – 12		wet peaty silt & sand 10YR3/3
7	12 – 14		wet peaty silt & sand 10YR3/3

J--Judgmental Unit

S--Systematic Unit

X--Artifact

Key

APPENDIX C

WESTON BORING LOGS

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 01SB-1
PAGE 1 **OF** 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-17-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 18.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		20, 30, 32	(SP) Moist, loose nonplastic 10yr5/3 med Sand	75% recovery
	2		24, 53, 50, 29	(SP-SM) Moist, loose, nonplastic non-sorted sand with Silt & Gravel and crushed brick.	25% recovery
	4		9, 5, 6, 9	(SM) Moist, moderate plasticity, silt silty Sand with Gravel and Ash.	25% recovery
	6		11, 12, 7, 9	(SM) Moist, 10yr2/1 loose, nonplastic silty Sand with some Gravel and broken asphalt (Fill).	50% recovery
	8		5, 4, 5, 9	Moist 10yr5/3 loose, nonplastic Sandy loam. (SW-SM)	25% recovery
	10		21, 14, 14, 17	10-11 Moist 10yr3/1, loose, non plastic silty Sand with Gravel (SW-SM) 11-12 Dry 10yr7/4, loose, non plastic med Sand. (SW)	75% recovery
	12		26, 33, 36, 50	10yr7/4 Moist, loose, non plastic M-C Sand. (SW)	75% recovery
	14		22, 25, 33, 47	10yr8/4 Moist, loose, non plastic m-c Sand with Gravel. (SW)	100% recovery
	16		29, 33, 55, 44	16-17.5 Saturated, 10yr8/3 loose, non plastic med Sand. (SW) 17.5-18 Saturated 10yr5/1 loose, nonplastic Sand with Gravel. (SW)	100% recovery
	18			End of boring 18'.	
	20				
	22				
	24				

COMMENTS: Field screening results did not detect gamma radiation or VOCs.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 01SB-2
PAGE 1 **OF** 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-17-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 21.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		15, 37, 40, 50/3	0-0.5' Asphalt. 0.5-2.0' Dry, loose, nonplastic fine to medium sand and crushed stone fill. (SP)	75% recovery
	2–4			10yr 3/2 moist, loose, nonplastic sand and gravel. (SP)	10% recovery
	4–6		20, 13, 6, 5	Same as 2' to 4'. (SP)	10% recovery
	6–8		2, 5, 7, 10	No sample recovery	0% recovery
	8–10		5, 5, 7, 12	Dry, loose, nonplastic, 10yr 2/1 sand. (SP)	50% recovery
	10–12		15, 17, 22, 22	Moist loose, 10yr 6/4, nonplastic interbedded fine to med sand. (SW)	100% recovery
	12–14		32, 19, 50/4"	12'-13.1' Moist, nonplastic, loose medium sand 10yr 5/4 (SW). 13.1'-13.5' Moist 10yr 5/2 firm nonplastic fine sand.	100% recovery
	14–16		50/3"	Dry, loose, nonplastic sand and gravel. (SW)	100% recovery
	17–19		15, 16, 13, 11	17-17.2 Same as 14'-16' (SW). 17.2-17.7 10yr 5/3 Moist, stiff, fine sand. 17.7-19 5y 5/1 Moist, firm, plastic, firm sandy clay (SC)	HNu - 5 units; 75% recovery
	19–21		10, 13, 13, 15	Saturated, high plasticity, stiff 5y 5/1 clay. (CH)	100% recovery
	21–22			End of boring at 21'	

COMMENTS: Unless otherwise indicated field screening results for gamma radiation and VOCs at background.

WESTON

3

ROY F. WESTON, INC.	WELL LOG
CLIENT: Army ~~Fee~~ Materials Technology Laboratory	WELL NUMBER: RFW-01SB-3
LOCATION: ~~2281-11-01~~ Watertown, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R & R, Inc.
DRILLING DATES: 10/8/91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 18.0 FT. BELOW GROUND SURFACE
WELL DEPTH: ___._ FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DK 5W
SAMPLER	1 3/8" Split-Spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	0–2	—	—, 11, 17, 21	GW-GM ≥15% sand; dry, loose, no plasticity (fill material); variegated	augured through top 6" of asphalt; 25% recovery
	2–4	01SB-3-2	25, 16, 11, 9	GW-GM ≥15% sand; dry, loose, no plasticity (fill material); 10YR6/6	not enough for lithologic sample; 50% recovery
	4–6	01SB-3-4		GW-GM ≥15% sand (4.0'-4.4'); dry, loose, no plasticity; Fill material; 10YR 6/6 ML <15%; moist, stiff, low plasticity 10YR5/4 4.4'-5.0'	not enough for lithologic sample 50% recovery
	6–8	01SB-3-6		ML <15%; moist, stiff, low plasticity; 10YR5/4	100% recovery
	8–10	01SB-3-8		ML <15%; moist, stiff, low plasticity 10YR5/4	100% recovery
	10–12	—		ML <15% sand, gravel; moist, stiff, low plasticity, 10YR5/4	100% recovery
	12–14	01SB-3-12		ML <15% sand, gravel; moist, stiff, low plasticity 10YR5/4	100% recovery
	14–16			ML <15% sand, gravel; ~~moist~~ wet, stiff, low plasticity; ~5% clay; 10YR5/4	100% recovery
	20				
	25				

COMMENTS: TOTAL DEPTH TO WATER TABLE ~16'
01SB-3

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

4

ROY F. WESTON, INC. CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY LOCATION: WATERTOWN, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: 02SB-2 PAGE / OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-10-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DANEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		24, 12	0-1' CONCRETE FLOOR 1-2' ~~10yR 4/2~~ RJE No RECOVERY	NO RECOVERY
	2–4		14, 34, 53, 50/1	10YR 4/2 Dry, SOFT, nonplastic Poorly sorted SAND, 20% subang gravel (SW)	50% recovery
	4–6		8, 18, 24, 13	10YR 5/2 - 10yR 6/2 Dry, SOFT, nonplastic VERY FINE SAND and SILT, trace med sand in upper .5'. (ML-SM)	50% recovery
	6–8		26, 50/2	10yR 6/2 Dry, Firm, nonplastic SILT, 40% fine sand, 1" thick bed of fine sand w/30% SILT (ML)	50% recovery
	8–10		70, 50/3	10yR 6/2 Dry, Loose, nonplastic SILT, 40% fine sand, trace subang. gravel. (ML)	50% recovery
	10–12		29, 20, 20, 30	10yR 4/3 WET, STIFF, MOD PLASTIC SILT AND CLAY, 1-2 lenses w/ 10% fine sand! (CL)	HNu = 8 units (moisture?) 75% recovery
	12–14		12, 17, 12, 12	10yR 4/3 WET, STIFF, High plastic. CLAY, 10% SILT (CH-CL)	HNu = 2 units (moisture) 75% recovery
	14–16		8, 7, 8, 8	10yR 4/3 SATURATED, STIFF, High plasticity CLAY, 10% SILT (CH-CL)	100% recovery
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated @ 16'
NO FILL ENCOUNTERED

WESTON

MASTER 5

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 02SB-3
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-10-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		8, 7	0-1': CONCRETE FLOOR 1-2': 10yr 2/2 Damp, soft, nonplastic SILT, 10% fine sand, trace organics (ML)	70% recovery
	2–4		18, 18, 34, 42	10yr 6/3 Dry, stiff, nonplastic poorly sorted sand, 10% subang. gravel. (SW)	40% recovery
	4–6		10, 35, 56, 56	10yr 5/3 Dry, soft, nonplastic POORLY SORTED SAND, 20% subang. gravel. (SW)	30% recovery
	6–8		67, 43, 41, 56	10yR 5/3 Dry, stiff, nonplastic poorly sorted sand, 40% fine to coarse subang. gravel (SW)	50% recovery
	8–10		21, 17, 21, 18	10yr 5/4 Damp, stiff, ~~nonplastic~~ mod. plastic SILT, 20% CLAY, 10% very fine sand (ML)	50% recovery
	10–12		18, 14, 12, 18	10yr 5/4 WET, STIFF, HIGH PLASTIC CLAY and SILT, approx 50% each. (CL)	75% recovery
	12–14		13, 17, 21, 21	10yr 5/4 WET, STIFF, LOW PLASTIC. SILT, 20% clay (ML)	80% recovery
	14–16		12, 14, 18, 12	10yR 5/4 SATURATED, STIFF, HIGH PLASTIC. CLAY, 25% SILT. occasional 1/4" SILT & FINE SAND layers. (CL)	100% recovery
	18				
	20				
	22				
	24				

COMMENTS:
- Boring Terminated @ 16'.
- ALL HNU & CAD READINGS @ background levels.
- NO FILL ENCOUNTERED.

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WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: Army Material Technology Laboratory	WELL NUMBER: 02SB4
LOCATION: Watertown, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R & R International, Inc.
DRILLING DATES: 10-13-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 18.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		17 25	0-1.0 Asphalt, crushed stone 1'-2' loose, dry, 10yr 2/1 Sand & (SP) Gravel with silt and asphalt mixed in.	100% recovery HNu=7units
	2		9 4 6 47	Unsorted, moist, loose, low plasticity Silt with Clay and Gravel with asphalt (ML)	HNu-7units 50% recovery
	4		42 50/1"	Moist, loose, non plastic Sand & Gravel with Asphalt. 10yr ?/1 (SP)	HNu-5units 100% recovery
	6		21 50/5"	10yr 5/3 Dry, loose, nonplastic Sand & Gravel. (SP)	75% recovery
	8		8 10	No sample recovery.	0% recovery
	10		52 24 36 37	Moist, firm, moderate plasticity 10yr 5/2 silty Clay. (CH)	75% recovery
	12		15 15 20 40	12-12.5 Same as 10'-12' (CH) 12.5'-14' Moist, firm, non plastic 10yr 5/3 fine Sand; (SW)	50% recovery
	14		6 9 12 14	10yr 5/3 Moist, firm, non plastic to moderate plasticity, interbedded (SC) clay, silt, and fine sand.	HNu-7units 100% recovery
	16		13 32 17 30	16-16.9 Saturated same as 14' to 16 (SC) 16.9-17.6 10yr 5/3 Moist nonplastic F. Sand 17.6-18 Moist, stiff, plastic 10yr 5/4 Clay	95% recovery
	18			End of boring 18'	
	20				
	22				
	24				

COMMENTS: Unless otherwise indicated field screening results for gamma radiation and VOC's at background.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 03SB-1
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-1-91
INSPECTOR: Richard Eichmann
BOREHOLE DEPTH: 1.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0			0-0.75' - Cored through 0.75' of concrete. Collect soil for chemical analysis at 0.75'	
	2				
	4				
	6				
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring 03SB-1 inside building 43. Can not access with drill rig therefore core through concrete with hand-operated coring machine and collected soil sample for analysis at soil/concrete interface.

WESTON

8

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 03SB-2
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11/7/91
INSPECTOR: Tim Warr
BOREHOLE DEPTH: 24 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0			0-0.85' Concrete floor.	
			22, 24, 10	10YR 3/2, Wet, soft, non plastic, f-c Sand, 10% Silt, 10% subangular gravel and brick. (SW)	53% Recovery
	2		6, 4, 6, 14	No Recovery. Brick in nose of spoon.	No Recovery
	4		10, 12, 14, 9	Upper 0.6' 10YR 3/2, Dry, soft, non plastic, f. (SM-SM) Sand, 15% silt, 15% c. sand and Gravel. Lower 0.7' 10YR 7/6, dry, soft, none plastic, f. (SP) sand, <4% silt, 5% subangular gravel.	Piece of Slag 65% Recovery
	6		20, 23, 25, 50/2"	upper 0.4' 10YR 6/6, dry, soft, non plastic, f. sand, 5% (SP) m-c Sand, 5% silt. middle 0.6' 10YR 6/3, f-c sand, 10% subangular gravel, 5% silt (SW) Lower 0.4' 10YR 7/6 dry soft, non plastic, f. sand 5% silt. (SP)	65% Recovery
	8		43, 50, 40, 32	upper 0.4' 10YR 3/2, moist, soft, non plastic, f. sand, (SP-PT) 15% silt, 40% organics. Possible buried top soil. middle 0.2 10YR 5/4, dry, soft, nonplastic, silty f. sand (SM) 10% c. sand and subang gravel. Lower 0.9' 10YR 6/4 f-c sand, 10% silt 15% sub ang gravel (SW)	65% Recovery
	10		17, 19, 23, 32	10YR 6/3, dry, soft non plastic, f-c sand, (SW) 10% subangular gravel, 5% silt.	70% Recovery
	12		22, 33, 36, 27	10YR 5/4, dry, soft, non plastic, f-c sand, (SW) 15% subangular gravel, 5% silt.	Piece of brick 65% Recovery
	14		12, 24, 18, 23	10YR 5/4 dry, soft, non plastic, f-c (SW) sand, 10% subangular gravel, 5% silt.	30% Recovery
	16		22, 16, 16, 25	10YR 5/6, damp, soft, nonplastic, f-m sand, 1% c. sand and sub angular gravel, 5% silt.	75% Recovery
	18		33, 20, 25, 30	upper 0.2' 10YR 6/3, dry, soft, nonplastic, f. sand, (SP) 15% c. sand and subangular gravel. Lower 1.5' 10YR 5/4, moist, soft, nonplastic, silty (SM-SC) f. sand. 1" to 2" clayey silt interbeds every 5"-6".	85% Recovery
	20		31, 20, 16, 13	10YR 6/2, saturated, soft, nonplastic, silty fine sand. Soil soaked with petroleum product. Smelled like fuel oil.	HNu: 10ppm 75% Recovery
	22		9, 9, 12, 15	10YR 5/2, saturated, stiff, highly plastic, alternating silty fine sand and silt/clay. Silty clay beds 2"-4" thick.	Smelled like fuel oil. HNu not working. 90% Recovery
	24				

COMMENTS: Boring terminated at 24'. Bottom of fill encountered at 16'.

WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY	WELL NUMBER: 4SB-1 GRSB-4
LOCATION: WATERTOWN, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-27-91
INSPECTOR: RICHARD EICHMAN
BOREHOLE DEPTH: 2.5 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		23 50/3	0-.5' ASPHALT ROADWAY & BASE MATERIAL .5-.8' 10YR 2/2-5/3 Dry, LOOSE NONPLASTIC 45% FINE-COARSE SAND, 45% SILT, 10% subang. gravel (SM)	40% recovery
	2			Spoon refusal on metal object at 2.5'	
	4				
	6				
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated due to auger/spoon refusal on A METAL OBJECT at 2.5'
ALL HNU and RAD readings AT background levels
No SUBSTANTIAL thickness of fill encountered below Asphalt base course.

MW-21

WESTON

ROY F. WESTON, INC.
CLIENT: US ARMY USATHAMA
LOCATION: Watertown Ars. Watertown MASS.
WORK ORDER NUMBER: 2281-11-01-0040

WELL LOG
WELL NUMBER: RFW-MW-21
PAGE 1 OF 3 05SB1

DRILLING CONTRACTOR: R & R International INC
DRILLING DATES: 10/3/91 — 10/11/91
INSPECTOR: Jean kelly, Steven O Brien
BOREHOLE DEPTH: 69.5 FT. BELOW GROUND SURFACE
WELL DEPTH: 68.9 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	CME 75
SAMPLER	1 3/8" SS
HAMMER WEIGHT	140 lbs
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
Portland + Bentonite; Riser	0	05SB-1	1, 2, 5, 5	OL/OH Dark Brown silty organic Topsoil. SW gray fine to coarse < 15% gravel < 5% silt. GW - well graded gravel and F-C sand few cobbels	
Riser	5		4, 10, 15, 27	SW-SM Brown Fine - coarse sand little F-C gravel < 10% Fines	
Portland + Bentonite; Riser	10		12, 18, 22, 32	same as above (SW - SM)	
Riser	15		16, 15, 16, 18	ML Brown silt and sandy silt with small scale clay beds. Horrizontal Bedding	
Riser	20		5, 10, 14, 18	same as above (ML)	
Riser	25		8, 16	same as above (ML)	

COMMENTS: MW-21 installed at this location

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

MW-21

WESTON

ROY F. WESTON, INC. CLIENT: US Army USATHAMA LOCATION: Watertown Arsenal: Watertown MA WORK ORDER NUMBER: 2281-11-01-0040	WELL LOG WELL NUMBER: RFW-MW-21 05SB1 PAGE 2 OF 3

DRILLING CONTRACTOR: R&R International Inc DRILLING DATES: 10-9-91 to 10-11-91 INSPECTOR: John Kelly, Steve O'Brien BOREHOLE DEPTH: 69.5 FT. BELOW GROUND SURFACE WELL DEPTH: 68.9 FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL GROUNDWATER ELEVATION: FT. AMSL	DRILLING EQUIPMENT	
	DRILL RIG	CME-75
	SAMPLER	1 3/8" SS
	HAMMER WEIGHT	140 lbs
	LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
Riser; Portland + Bentonite grout	25		8, 16, 15, 14	ML Brown Sandy silt with small scale elem gray Clay beds. Horrizontal bedding some iron stains	
Riser	30		6, 9, 22, 23	Same as above (ML)	
	35		7, 8, 12, 23	Same as above (ML) CL mottled silty Fine sand with some gray clay beds	
	40		9, 10, 10, 10	ML Brown Sandy silt CH Brown gray clay interbedded with Brown silty sands	
Riser	45		10, 14, 26, 35	ML Brown Sandy silt with few gray clay lenses CL Gray sandy lean clay with lenses of gray silty sand	
	50		9, 10	ML Brown sandy silt	

COMMENTS:

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: U.S. Army USATHAMA
LOCATION: Watertown Arsenal Watertown, MA
WORK ORDER NUMBER: 2281-11-01-0040

WELL LOG
WELL NUMBER: RFW-MW-21
PAGE 3 OF 3
05501

DRILLING CONTRACTOR: P & R International
DRILLING DATES: 10-9-91 - 10-11-91
INSPECTOR: John Kelley, Steven O'Brien
BOREHOLE DEPTH: 59.5 FT. BELOW GROUND SURFACE
WELL DEPTH: 58.9 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	CME - 75
SAMPLER	1 3/8" SS
HAMMER WEIGHT	140 lbs
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
Bentonite	50		9	ML Brown sandy silt	
			10, 14, 17	SP-SM Brown gray Fine sand Little silt	
Riser; Silica Sand	55		10, 20, 20, 25	SP-SM same as above with Little silt lenses	
				SP-SM Brown gray silty sand Traces of gray clay	
SCReen; Silica Sand	60		100/5	GW-GC. Brown gray (Till) silt and F-C sand little gravel	
				Dense gravely glacial Till some 1-2' Boulders Tough drilling	
58.9' Bottom Plug	65			69'6" Auger Refusal EOB	
	70			Possible Bedrock	
Possible Bedrock	75				

COMMENTS:

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: 0558-2
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-24-91
INSPECTOR: Tim WARR
BOREHOLE DEPTH: 12 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION: NO WELL INSTALLED

DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
0–2		3, 11, 11, 16	0-0.5 10yr 3/4 soft, dry, nonplastic fine (SM-PT) sand, 20-35% silt, 20-35% organics, roots. 0.5-1.9 10yr 3/2 fine-coarse sand, trace (SW) silt, tr fine subang gravel soft, dry nonplastic	95% recovery
2–4		20, 31, 19, 20	upper .5': 10yr 3/2, firm, dry, nonplastic (SP) fine to med sand, 20% coal fragments. lower .8' (SP) 10yr 3/3 fine sand, trace gravel	65% recovery
4–6		7, 15, 29, 64	upper .3': 10yr 3/3, soft, dry, nonplastic, fine (SP) to medium sand, trace silt, trace subang. gravel. lower 1': (SW) 10yr 6/4 f-c sand, 20% gravel, tr silt	65% recovery
6–8		80/5"	10yr 6/3 soft, dry, nonplastic (SW) fine-coarse sand, trace silt 15% subang. gravel.	Cobbles @6.5-8.0' 20% recovery
8–10		27, 20, 13, 10	upper .7': 10yr 3/3, soft, moist, non plastic, fine-coarse sand, trace silt, trace gravel (subang.) (SW)	75% recovery
10–12		13, 30, 16, 19	10yr 6/3 stiff, saturated, low plasticity silt, trace fine sand, trace clay (SM)	75% recovery

COMMENTS: Boring terminated @ 12'.
End of fill encountered at 4'.
All HNu and RAD readings at background levels.

MW-
13

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: OSS3-1 MW-15A
PAGE 1 OF 3

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: 10-10-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 63.5 FT. BELOW GROUND SURFACE
WELL DEPTH: 61.9 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW 15A installed See well log for well construction details	0–2		10, 6, 17, 17	0-0.5 10yr 3/2 Silty loam topsoil (ML) 0.5-2.0 10yr 3/2 Dry nonplastic, loose (ML) Sandy silt with some gravel Fill.	75% recovery
	2–4		15, 27, 36, 45	10yr 6/2 Dry, loose, nonplastic coarse sand and gravel (fill). (SP)	50% recovery
	4–6		100/.3', –, 19, 43	10yr 4/4 Moist low plasticity (MH) Sandy Silt with Gravel.	25% recovery
	6–8		10, 17, 32, 27	10yr 5/3 Dry, loose, non (SP) plastic coarse Sand and Gravel fill.	75% recovery
	8–10		13, 31, 33, 33	Same as 6' to 8' Fill (SP)	75% recovery
	10–12		12, 13, 13, 15	10 - 10.5 Same as 6' to 10' (SP) Sharp contact (SM) 10yr 4/4 Moist, firm silty Sand to silty Clay.	75% recovery
	12–14		17, 18, 23, 20	(SM) 10yr 4/4 Moist, stiff, mod plasticity Interbedded silty (CH) fine sand to silty clay.	75% recovery
	14–16		2, 10, 8, 8	10yr 3/3 Moist, stiff sandy (ML) silt with gravel	100% recovery
	16–18		10, 12, 14, 13	10yr 5/2 Saturated, stiff inter-(SM) bedded silty fine sand and (CH) clay.	100% recovery
	18–20		6, 13, 21, 23	Same as 16'-18'.	100% recovery
	20–22				
	22–24				
	24–				

COMMENTS: Begin 5-foot sampling interval at 20 feet
Field screening results indicate no gamma radiation or VOCs detected.

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Testing Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: OG SB1
PAGE 2 OF 3

DRILLING CONTRACTOR: R & R International Inc.
DRILLING DATES: 10-0-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 53.5 FT. BELOW GROUND SURFACE
WELL DEPTH: 51.9 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW 1A Installed. See well log for well construction details.	25, 26, 27		6, 5, 7, 14	25-26.2' 10yr 7/3 Moist, firm (MH) Silt with some sand and clay. 26.2-27' 5y 4/1 Moist, stiff, high (CH) plasticity clay	100% recovery
	30, 31, 32		6, 8, 15, 21	(MH) 30-30.4 10yr 6/1 Saturated, loose silt with clay. (CH) 30.4-31.6 10y 5/3 Moist, stiff high plasticity, silty Clay. 31.6-32 10yr 6/1 Saturated (MH) loose Silt with Clay.	100% recovery
	35, 36, 37		5, 12, 15, 20	35-35.9 10yr 6/3 Saturated, firm (MH) Silt with Clay. 35.9-36.2 10yr 5/1 Moist, stiff (CH) moderate plasticity silty Clay. 36.2-37 10yr 6/3 Saturated, loose (MH) Silt with Clay.	100% recovery
	40, 41, 42		5, 11, 13, 15	40-40.9 10yr 6/3 Saturated (MH) loose Silt with clay. 40.9-41.3 10yr 5/1 Moist, stiff (CH) high plasticity Clay. 41.3'-42' 10yr 6/3 Saturated (MH) loose thinly laminated Silt and silt with clay.	100% recovery
	45, 46, 47		8, 12, 15, 38	45-46.5 Moist, firm, 10yr 7/2 (MH) Sandy Silt. 46.5'-47' Moist firm 10yr 7/2 (CH) Silty Clay.	100% recovery
	50				

COMMENTS: Field screening results indicate no gamma radiation or VOCs detected

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC. CLIENT: Army Materials Testing Laboratory LOCATION: Watertown MA WORK ORDER NUMBER: 2281-11-[illegible]	WELL LOG WELL NUMBER. 06SB1 PAGE 3 OF 3

DRILLING CONTRACTOR: R & R International, Inc. DRILLING DATES: INSPECTOR: BOREHOLE DEPTH: 63.5 FT. BELOW GROUND SURFACE WELL DEPTH: 61.9 FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL GROUNDWATER ELEVATION: FT. AMSL	DRILLING EQUIPMENT	
	DRILL RIG	Davey Kent
	SAMPLER	1 3/8" split spoon
	HAMMER WEIGHT	140 lb
	LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW15A installed	50		17	50-51.5 [illegible] 5/3 Saturated, loose (MH) Silt with clay.	[illegible] recovery
	51		23		
See well log for well construction details.			31	51.5-52.0 [illegible] 3/3 Moist, firm (CH) Clay with sand.	
	52		69		
	55		72	Poorly sorted, saturated loose, Clay, silt and coarse sand with angular gravel. (till)	100% recovery
	56		79		
			100		
	57		80		
				Same as above (till).	
	60		53		100% recovery
	61		76		
			100		
	62		54		
				63.5' Auger Refusal	
	15				
	20				
	25				

COMMENTS: Field screening results indicate no gamma radiation or VOCs detected.

WESTON

14

ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-06SB-2
PAGE 1 OF _

DRILLING CONTRACTOR: R&R, Inc.
DRILLING DATES: 10/9/91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 18' FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
No well installed	0	06SB-2-0 ~~06SB-2-1~~	2, 6, 16, 27	OL/OH (15-25% sand, gravel) dry, loose, no plasticity 10YR 2/2 (0-1.2')	50% recovery not enough for lithologic sample
	2		17, 10, 10, 11	SC (<15% gravel) fine-grained, stiff, dry, low plasticity 10YR 6/1 (2'-3')	50% recovery
	4		9, 3, 6, 5	SC (<15% gravel) fine-grained, stiff, dry, low plasticity; <5% sand 10YR 6/1 (4'-5.2')	50% recovery
	6		6, 6, 6, 5	CL (<15% sand, gravel) some silt noted; stiff, wet, med. plasticity 10YR 6/1 (6'-7.4')	75% recovery
	8		5, 2, 2, 19	CL (<15% sand, gravel) wet, stiff, med. plasticity, variegated (8'-8.7') GW-GM (>15% sand) dry, loose, no plasticity, variegated, Fe-staining (8.7'-9.3')	75% recovery
	10		78, 4, 13, 21	SC (<15% gravel) stiff, moist, low plasticity, 10YR 5/1 (10'-11') SW-SM (>15% gravel) loose, dry, no plasticity 10YR 8/2 (11'-11.3')	75% recovery
	12		15, 8, 20, 21	CL <15% sand, gravel; some silt, stiff, moist, med. plasticity 10YR 5/2 CL (<15% sand, gravel) stiff, moist, med. plasticity, 10YR 2/3 (12'-13.6')	75% recovery
	14		25, 12, 11, 11	CL (15%-25%) lean clay w/sand, stiff, moist, med. plasticity 10YR 5/2 (14'-15.8')	95% recovery
	16	06SB-2-16	12, 13, 12, 12, 11	SC (<15% gravel) fine sand, stiff, moist, low-med. plasticity 10YR 5/1 (16'-18')	100% recovery
				18' End of Boring	
	20				
	25				

COMMENTS: 06SB-2; All HNu and RAD readings at background.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA.
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 05S33
PAGE 1 **OF** 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-11-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 20.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		20, 20, 20, 23	0-0.5 Asphalt	25% recovery
	2–4		5, 16, 12, 13	No sample recovery	0% recovery
	4–6		7, 4, 7, 6	Dry, loose sand, gravel, clay, (SP-SC) and asphalt (Fill).	50% recovery
	6–8		24, 34, 71, 51	Dry, loose Sand and Gravel with some Clay (Fill). (SP-SC)	50% recovery HNu - 8 units
	8–10		26, 25, 53, 66	Rocks, cobbles, sand & Gravel. (SP) (fill)	70% recovery HNu - 10 units
	10–12		40, 70, 63, 74	(SP) Fill material same as 8-10'	75% recovery
	12–14		85, 57, 55, 50/0.1'	Dry, loose, nonplastic sand and cobbles with little Silt. (SP-SM)	70% recovery
	14–16		53, 13, 10, 12	14-15' Same as 12' to 14' (SP-SM) 15' 6" 10yr 5/2 Dry, stiff mod plastic (CL) Silty Clay.	4Nu - 15 units 75% recovery
	16–18		12, 13, 15, 26	Same as 15' to 15' (CL)	100% recovery
	18–20		5, 14, 13, 6	10yr 6/2 Stiff, mod plasticity (CH) silty Clay. Soil saturated at 20 feet. End of Boring 20'	100% recovery
	22				
	24				

COMMENTS: Unless otherwise indicated field screening results for gamma radiation and VOCs at background.

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WESTON

ROY F. WESTON, INC. CLIENT: Army Materials Technology Laboratory LOCATION: Watertown, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: ~~RFW~~-06SB-4 PAGE 1 OF 1

DRILLING CONTRACTOR: R&R, Inc.
DRILLING DATES: 10/9/91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 18.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DK SW
SAMPLER	G. Hall / M. House
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30 inch

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	0–2	06SB-4-0	11, 17, 28, 37	OL/OH <15% sand; dark, loose, moist, no plasticity; 10YR 5/2 (0-0.5') GW-GM ≥ 15% sand (0.5'-1.6'); loose, dry, no plasticity; 10YR 5/2	75% recovery not enough for lithologic sample
	2–4	—	36, 25, 25, 24	GW-GM ≥ 15% sand; dry, loose, no plasticity; 10YR 3/3 (2'-3')	50% recovery
	4–6	—	33, 20, 21, 19	SW-~~SM~~ ≥ 15% gravel w/silt; dry, loose, no plasticity; 10YR 3/3 (4'-4.8')	40% recovery
	6–8	—	35, 32, 5, 1	SW-SM ≥ 15% gravel w/sand; dry, loose, no plasticity; 10YR 3/3 (6'-6.5')	30% recovery
	8–10	—	9, 25, 35, 39	GW ≥ 15% sand; dry, loose, slightly moist, no plasticity 10YR 5/4 (8'-9')	50% recovery
	10–12	06SB-4-10	15, 27, 27, 47	SW ≥ 15% gravel; moist, loose, no plasticity, well-sorted 10YR 5/4 (10'-11')	50% recovery not enough for lithologic sample
	12–14	—	61, 18, 31, 19	SW ≥ 15% gravel; moist, loose, no plasticity 10YR 5/4 (12'-12.5') SM <15% gravel, moist, firm, low plasticity 10YR 6/2 (12.5'-13.2')	50% recovery HNu = 10-15 units
	14–16	—	11, 7, 8, 7	CL <15% sand, gravel; some fine sand present at top of interval (sandy lean clay) moist, stiff, some Fe-staining 10YR 5/1 (14'-16')	100% recovery
	16–18	06SB-4-16	4, 2, 11, 11	SM <15% gravel; wet, stiff, low plasticity 10YR 4/3 (16'-18') saturated	100% recovery not enough for lithologic sample
	18			End of boring 18'	
	20				
	25				

COMMENTS: 06SB-4: Field screening results indicate gamma radiation and VOCs at background.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-06SB-5
PAGE 1 OF 3

DRILLING CONTRACTOR: R&R, INC.
DRILLING DATES: 10/9 – 10/10/91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 71.0 FT. BELOW GROUND SURFACE
WELL DEPTH: 59.6 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	2" split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW17D installed See well log for well construction details	0–2	06SB-5-0	12 9 13 7	OL/OH (<15% gravel); dry, loose, no plasticity - 10YR 4/2 (0-1') GW (≥15% sand) dry, loose, no plasticity, variegated (1'-1.4') (fill material?)	50% recovery not enough for lithologic sample
	2–4		24 13 19 18	SM (≥15% gravel); dry, loose, no plasticity, color varies (2'-3'); some asphalt tar present (fill material?)	50% recovery
	4–6		43 13 25 27	SM (≥15% gravel); dry, loose, no plasticity 10YR 3/1 (4'-4.5') GW (≥15% gravel); dry, loose, no plasticity; 10YR 5/4 (4.5'-5')	50% recovery
	6–8		29 25 60 51	SW (<15% gravel); dry, loose, no plasticity, 10YR 5/4 (6'-7.5')	[illegible] recovery
	8–10		48 60 — —	SW (<15% gravel); dry, loose, no plasticity 10YR 5/4 (8'-9') AUGURED THROUGH ROCK	100% recovery NO RECOVERY
	10–12		5 8 12 14	SW (<15% gravel); dry, loose, no plasticity, 10YR 5/4 (10'-10.5') SM (<15% gravel); moist, firm, low plasticity 10YR 5/3 (10.5'-11.5')	75% recovery
	12–14		14 12 13 19	SM (<15% gravel); moist firm, low plasticity 10YR 5/3 (12'-14')	100% recovery
	14–16		15 12 14 7	CL (15-25% sand, gravel) lean clay w/sand; wet, some gravel, stiff; med. plasticity; 10YR 5/3 (14'-14.5')	25% recovery
	16–18		4 4 4 8 10	SPLIT SPOON IS WET, APPROX DEPTH of WATER TABLE IS 16'	NO RECOVERY
	18–20		5 14 17 5		NO RECOVERY
	20–25				

COMMENTS: 06SB-5; BORING DRILLED DEEPER for MONITORING WELL, WATER TABLE DEPTH ~~~20'~~ ~16' GH

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2251-11-01

WELL LOG
WELL NUMBER: RFW-06SB-5
PAGE 3 OF 3

DRILLING CONTRACTOR: R&R International Inc.
DRILLING DATES: 10/9 - 10/10/91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 71.0 FT. BELOW GROUND SURFACE
WELL DEPTH: 59.6 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
				DID NOT SAMPLE	
MW17A installed. See well log for well construction details.	50–52		11, 15, 12, 11	CL (<15% gravel) lean clay; stiff, moist, med. plasticity 4Y4/1 (50'-50.2') SC (<15% gravel) clayey ~~sand~~ ~~fcla~~, wet slightly stiff, variegated, Fe staining (50.2'-52')	100% recovery
	52–55			DID NOT SAMPLE	
	55–57		5, 8, 13, 13	CL (<15% sand, gravel) pure clay; stiff moist, high plasticity, Boston Blue clay, marine 4Y 4/1 (55-55.5') SC (<15% sand, gravel); sand w/ marine clay, wet, loose, variegated, Fe-staining (55.5'-57')	100% recovery
	57–60			DID NOT SAMPLE	
	60–62		9, 8, 31, 15	SP (<15% gravel); loose, moist, low plasticity, ~~4Y 4/1~~ 5Y5/2 (60'-60.3') CL (<15% sand, gravel) pure clay, moist, stiff, med. plasticity, Boston blue clay, marine, 5Y5/2 (60.3'-60.6') SP (<15% gravel) moist, firm, low plasticity, Fe-stains, variegated (60.6'-62')	100% recovery
	62–65			DID NOT SAMPLE	
	65–67		6, 11, 16, 19	SP (<15% gravel); loose, moist, no plasticity, 10YR6/1 (65'-67')	100% recovery
	67–70			DID NOT SAMPLE	
	70–71		19, 90	SP (<15% gravel), wet, loose, no plasticity 10YR 6/2 (70'-70.6') ~~CL (glacial till)~~ (GH) CL (<15% sand) glacial till; stiff, moist, med. plasticity w/ angular rock fragments 10YR 7/3	100% recovery of 1'

COMMENTS: p. 3. 06SB-5

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: 07SB1
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-1[illegible]
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 15.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		6, 21, 19, 45	0-0.4 10yr 3/1 Moist [illegible] silty loam (ML) 0.4-2.0 Moist, loose, nonplastic sand and fine gravel 10yr 5/4. (SP)	75% recovery
	2–4		26, 36, 31, [illegible]	10yr 4/4 Dry, firm, nonplastic silty sand with cobbles. (SM)	25% recovery
	4–6		27, 50/4"	10yr 6/2 Dry nonplastic loose coarse sand and gravel. (SP)	• No-Sonits 75% recovery
	6–8		57, 50/3	Dry, loose nonplastic sand gravel and cobbles.	+ No-Sonits 100% recovery
	8–10		50/4"	10yr 5/3 Dry, loose, nonplastic (SP) sand with gravel.	100% recovery
	10–12		---	No sample collected due to difficult drilling conditions.	
	12–14		19, 19, 20, 12	12-12.5 Same as 5'-10' (SP) 12.5-13 Saturated fine sand and silt, no plasticity, firm (SM) 13-14 10yr 5/2 Moist firm plastic silty clay	100% recovery
	14–16		2, 7, 15, 16	(CL) Same as 13'-14' Saturated Silty Clay	100% recovery
	16			End of boring 15'.	
	18				
	20				
	22				
	24				

COMMENTS: Unless otherwise indicated field screening results for gamma radiation and VOCs at background.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: [illegible]
PAGE 1 OF [illegible]

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: 11 [illegible] 9[illegible]
INSPECTOR: Tim Warr
BOREHOLE DEPTH: 6 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Mobil Skid Rig
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0			0-.8 Concrete Floor. upper 0.3, 7.5YR 3/2, moist, soft, non plastic, coal, slag and ash, 20% f-c sand, 5% silt (Cl-SW) lower 0.2, 10YR 4/6, wet, soft, non plastic, f sand, 20% [illegible] gravel and subangular (SP-SW)	100% Recovery [illegible]
	2		7, 17, 37, 27	10YR 6/3, dry, soft, nonplastic, f-c sand, (SW) 20% subangular gravel, 5% silt	45% Recovery
	4		35, 37, 33, 33, 43	10YR 6/2, dry, soft, nonplastic, f-c sand, 25% subangular gravel, 5% silt.	50% Recovery
	6				
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 6'.
Bottom of fill encountered at 2'.
Mobil Skid rig will not drill deeper at this location

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 06SB-3
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: [illegible]
INSPECTOR: [illegible]
BOREHOLE DEPTH: 10 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Mobil Skid Rig
SAMPLER	1 3/8" Split Spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0			0-10" Concrete floor	
	0–2		9, 3	10YR 3/2, wet, soft, [illegible] f-c Sand, 5% (SW-SP) subangular gravel, 10% silt, 20% coal dust and organics	20% Recovery
	2–4		8, 12, 49, 37	upper 0.8' 5YR 2.5/1, Coal and Coal dust; lower 0.3' 7.5YR 4/4, dry, soft, nonplastic, (SM) Silty f. sand, 5% m-c sand, 1% subangular gravel.	25% Recovery
	4–6		23, 27, 35, 12	upper 0.9' 10YR 2/1, dry, soft nonplastic, f. (SP) sand, 10% m-c sand and gravel, 10% silt; middle 0.2' 10YR 6/6, f. sand, 5% silt (SP); lower 1.0' 10YR 6/2, dry, soft nonplastic, f-c sand, 30% subangular gravel (SW-GW)	100% Recovery
	6–8		17, 41, 46, 38	10YR 6/2, dry, soft, nonplastic, gravelly sand, (SW-GW) 45% subangular gravel, 10% silt	75% Recovery
	8–10		54, 46, 57, 50	10YR 6/2, dry, soft, gravelly sand, 30% (SW-GW) subangular gravel, 10% silt, nonplastic	75% Recovery
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 10'.
Bottom of fill encountered at 5'.
Mobil skid rig will not drill deeper at this location

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 09SB-1
PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: [illegible]
INSPECTOR: [illegible]
BOREHOLE DEPTH: [illegible] FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		2, 7, 4, 3	Dry, loose, nonplastic [illegible] sandy loam with some gravel (SP-SM)	50% recovery
	2–4		5, 7, 11, 9	10yr 4/2 Dry loose sand with little angular Gravel and some Silt and Clay. (SP-SM)	HNu - 7units; 50% recovery
	4–6		11, 10, 12, 8	10yr 4/4 Moist loose silt with Clay and Gravel (ML-CL)	HNu - 7units; 25% recovery
	6–8		15, 64, 50/4	10yr 4/4 Dry, loose, nonplastic (SC) Sand & Gravel with some Clay	HNu - 9units; 50% recovery
	8–10		9, 57, 50/.3	10yr 4/4 Dry, loose Sand & Gravel with some silt. (SM)	HNu - 8 units; 40% recovery
	10–12			No sample collected due to difficult drilling conditions, large cobbles.	
	12–14			No sample collected	
	14–16			No sample collected	
	16–18			No sample collected	
	18–20		53, 80, 50/3"	10yr 6/2 Dry, loose, non-plastic Sand & Gravel with minor clay & silt. (SW-SM)	100% recovery
	20–22		30, 53, 50/2"	10yr 6/4 Moist, firm fine Sand. (SW)	50% recovery
	22–24		28, 25, 37, 47	22-22.2 Same as 20-22' (SW); 22.2-24 Dry loose nonplastic coarse (SW) sand with gravel & cobbles	75% recovery

COMMENTS: Unless otherwise indicated, field screening results for gamma radiation and VOC's at background.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: C9S?-1
PAGE 2 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: ?-12-91
INSPECTOR: [illegible]
BOREHOLE DEPTH: 34.5 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24–26		??, ?0, ?8, 25	Dry, loose, nonplastic coarse sand with gravel. (SW)	50% recovery
	26–28		24, 24, 21, 25	Same as 24'–26' (SW)	70% recovery
	28–30		19, 22, ?9, 29	Same as 24' to 28' (SW)	4NU-? units; 50% recovery
	30–32		19, 23, ?3, 42	Same as 24' to 30' (SW)	HNU-4 units; 55% recovery
	32–34		26, 17, 12, 12	Saturated (SW) Same as 24' to 32'	HNU-5 units; 65% recovery
	34–36		7, 13, 12, 22	Saturated (SW) Same as 24' to 34'	75% recovery
	36			End of boring 36'	
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: Unless otherwise indicated, field screening results for gamma radiation and VOC's at background.

WESTON

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ROY F. WESTON, INC.	WELL LOG
CLIENT: Army Materials Technology, Inc.	WELL NUMBER: RFW-10SB-1
LOCATION: Watertown, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R + R International, Inc.
DRILLING DATES: 10-14-9
INSPECTOR: Stephen L...
BOREHOLE DEPTH: 20.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: ... FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lb.
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
				0-0.25 Asphalt	
			11, 19, 20	... Dry ... plastic ... sorted ... to coarse Sand ... Gravel	90% recovery
			7, 26, 18	10YR 3/... Moist ... Sand with (SM) 20% Silt and 30% round ... Gravel	
			7, 27, 21, 12	3.2-4.0 Construction debris; 10YR ... Saturated, M... plasticity Firm Silt with ...% Coarse (MH) Sand.	30% recovery; 70% recovery
			16, 13, 39, 35, 50/4"	10YR 5/4 Moist ... Low plasticity (SM) Medium to Coarse Sand with 20% Silt and 30% rounded Gravel	70% recovery
			50/0"	Spoon refusal, no sample collected.	
			52/3"	Drilling cuttings indicate material is medium to coarse Sand with 20% Silt and 30% rounded Gravel. (SM)	
	15		50/1"		
	16, 17, 18		39, 10, 12, 27	10YR 5/2 Moist, Firm, High plasticity (MH) mottled clayey Silt with 5% F Sand. Sample is upgradient.	80% recovery
	20		10, 9, 16, 19	2.5Y 5/3 saturated, ... plasticity, Firm (MH) Silt and Clay with 10% fine Sand	30% recovery
	25				

COMMENTS: End of soil boring at 20 feet. Field screening results for soil ... radiation ... VOCs detected.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-~~10~~ SB-2
PAGE 1 OF 2

DRILLING CONTRACTOR: R+R International, Inc.
DRILLING DATES: 10-15-91
INSPECTOR: Stephen Lawlor
BOREHOLE DEPTH: 28.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lbs.
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	0–2		28, 33, 70	0-0.25' Asphalt 10YR 5/6 Dry, loose, nonplastic med (SP) Sand with [illegible] rounded Gravel	80% recovery
	2–4		41, 37, 38, 50/3"	(SP) 2-2.5 10YR 6/4 Dry, loose, nonplastic medium Sand (SM) 2.5-4 10YR 3/2 Moist soft, nonplastic Fine Sand and Silt	90% recovery
	4–6		22, 40, 59, 112	(SP) 10YR 6/4 Dry, loose nonplastic poorly sorted F-M-C Sand with 10% rounded Gravel	90% recovery
	6–8		64, 70/5"	(SP) 10YR 6.6 Dry loose nonplastic poorly sorted F-M-C Sand with 20% rounded Gravel.	100% recovery
	8–10		28, 46, 55, 46	(SP) 10YR 6/4 Dry loose, nonplastic poorly sorted F-M-C Sand with 20% rounded Gravel.	100% recovery
	10–12		25, 52, 40, 31	(SP) 10-11' 10YR 6/3 Moist, loose, nonplastic uniform fine med Sand (SP) 11-12' 10YR 5/6 Moist firm, nonplastic Fine to coarse Sand with 20% gravel	100% recovery
	12–14		27, 23, 27, 23	(SP) 12-14' 10YR 5/6 Moist, loose nonplastic poorly sorted F-M-C Sand with 20% rounded Gravel.	50% recovery
	14–16		15, 22, 29, 31	(SP) 10YR 5/4 Moist, soft nonplastic uniform med Sand.	80% recovery
	16–18		26, 26, 31, 43	(SP) 10YR 6/4 Moist, loose, nonplastic uniform med Sand with 10% rounded Gravel	90% recovery
	18–20		26, 27, 22, 43	(SP) 18-19 10YR 5/4 Moist loose nonplastic uniform med Sand. 19-20 10YR 3/2 Fine to med Sand with 20% rounded gravel	50% recovery 19-20 HNu-2
	20–22		13, 22, 23, 19	(SP) 10YR 2/1 Saturated Fine C Sand	HNu-5 units 80% recovery Free Product
	22–24		27, 25, 26, 23	(SP) 10YR 2/1 Saturated Moist Sand	HNu-7 units 90% recovery Free Product
	24–26		17, 28, 30, 28	(SP) 10YR 7/1 Firm, saturated low plasticity Fine Sand.	HNu-1 unit 50% recovery

COMMENTS: Free petroleum product encountered in soil from 20 to 24 Feet. Unless otherwise indicated field screening results indicate no gamma radiation or VOCs detected.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Technology laboratory
LOCATION: Watertown MA
WORK ORDER NUMBER: 2281-41-01

WELL LOG
WELL NUMBER: RFW-105B-2
PAGE 2 OF 2

DRILLING CONTRACTOR: R+R International, Inc.
DRILLING DATES: 10-15-91
INSPECTOR: Stephen Lawler
BOREHOLE DEPTH: 28.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lbs.
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	25		28 30 28	10yr 7/1. Firm, saturated, low (50) plasticity, uniform fine Sand	HNu - unit 50% recovery
	26		19 16 20 31	10yr 7/1 Saturated firm m (177) plasticity, uniform Silt	95% recovery HNu - 1 unit
	27			Bottom of hole 28'	
	5				
	10				
	15				
	20				
	25				

COMMENTS: End of boring 28 feet.
Unless otherwise indicated Field screening results indicate no gamma or radiation or VOC detected.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

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WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 1158-1
PAGE 1 OF 21

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-12-91
INSPECTOR: RICHARD EICHNER
BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		16, 14	0-1': CONCRETE FLOOR 1-2': 7.5Y 3/2 Dry, soft, nonplastic fine sand and silt, trace subang gravel. 10% organics in upper 6". (SM)	60% recovery
	2–4		11, 15, 44, 50/.1	no recovery	no recovery
	4–6		20, 28, 28, 30	10YR 6/4 Dry, soft, nonplastic fine and med sand, 10% coarse sand, 15% subang gravel. (SW)	60% recovery
	6–8		38, 44, 50/.1	10YR 6/4 Dry, soft, nonplastic fine and med. sand, trace coarse sand, 15% subang gravel. (SP-SW)	25% recovery
	8–10		30, 36, 33, 30	upper .5' soft, dry, nonplastic - same as above. lower .5' 10YR 7/3 stiff, dry, nonplastic fine sand, 1/8-1/4" coarse bedding. (SW-SP)	70% recovery
	10–12		30, 36, 52, 26	upper .3' same as lower .5' of above lower 1' 10YR 6/3 fine & med sand, 10% coarse sand, 10% gravel (subang-ang). stiff, dry, nonplastic (SW)	65% recovery
	12–14		20, 26, 50, 45	upper 1.1' 10YR 7/3 poorly sorted fine sand, trace med-coarse sand (SP) lower .4' 10YR 7/3 poorly sorted sand and subangular gravel! Dry, soft nonplastic (SP)	75% recovery
	14–16		24, 31, 27, 28	10YR 6/6 soft-stiff, dry, nonplastic poorly sorted sand with 40% subang. gravel (SW)	60% recovery
	16–18		21, 16, 15, 24	10YR 6/2 Gravel w/ 40% poorly sorted sand. Soft, dry, non plastic (SW)	50% recovery
	18–20		28, 40, 44, 50	2.5YR 4/4 dry, stiff nonplastic poorly sorted sand and gravel (SW)	60% recovery
	20–22		28, 40, 44, 50	2.5YR 4/4 Dry, stiff, nonplastic poorly sorted sand and gravel (SW)	~~50%~~ ~~60%~~ 6% recovery
	22–24		46, 31, 49, 26	2.5YR 4/4 wet, stiff, nonplastic poorly sorted sand and gravel (SW)	40% recovery
	24–26		7, 13, 14, 9	2.5YR 4/4 wet, stiff, nonplastic poorly sorted sand and gravel (SW)	75% recovery

COMMENTS: Boring terminated @ 26'
All HNU + RAD readings @ background levels
NO FILL ENCOUNTERED

WESTON

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ROY F. WESTON, INC.	WELL LOG
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY	WELL NUMBER: 1253-1
LOCATION: WATERTOWN, MA	PAGE 1 OF 2
WORK ORDER NUMBER: 2281-11-01	

	DRILLING EQUIPMENT	
DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.	DRILL RIG	DAVEY KENT
DRILLING DATES: 3-17-91	SAMPLER	1 3/8" SPLIT SPOON
INSPECTOR: [illegible]	HAMMER WEIGHT	140 lb
BOREHOLE DEPTH: 25.0 FT. BELOW GROUND SURFACE	LENGTH OF FALL	30"
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING		
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL		
GROUNDWATER ELEVATION: NA FT. AMSL		

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		12, 15, 54, 26	0.-0.3 Asphalt Pavement 0.30-0.75 [illegible] 6/3 Moist, soft, [illegible] plasticity fine to medium Sand 0.75-2.0 7.5YR 4/2 Moist nonplastic, soft C. Sand with 10% F Sand and 20% Gravel	100% recovery
	2		4, 10, 10	7.5YR 3/4 Moist, firm, [illegible] plasticity (ML) Silt and F. Sand with [illegible] Sand and [illegible] Ash	70% recovery
	4		9, 2, 5, 23	10YR [illegible]/2 Moist soft, [illegible] plasticity (SM) F to M Sand and Silt	70% recovery
	6		64, 50/2"	6-7' Moist nonplastic, soft M-OL Sand with 30% [illegible] Gravel 7-8 No Sample spoon refusal. (SW)	60% recovery
	8		54, 63, 69	(SW) 10YR 6/4 Moist, soft, nonplastic M-C Sand with 10% Sub-angular Gravel	100% recovery
	10		39, 59, 52, 30	(SW) 10YR 5/2 Moist, soft, [illegible] plasticity F-Med Sand with 20% [illegible] Gravel	80% recovery
	12		32, 36, 41, 33	10YR 5/4 (SW) Same as 10'-12'	50% recovery
	14		21, 27, 34, 45	10YR 5/4 Moist, nonplastic, firm (SW-SM) M to C Sand with 10% F Sand and 10% rounded Gravel	100% recovery
	16		42, 36, 35, 36	10YR 5/2 (SW-SM) Same as 14' to 16'	100% recovery
	18		17, 24, 29, 31	10YR 5/2 Moist, firm, nonplastic (SW) uniform fine Sand	100% recovery
	20		12, 6, 22, 21	10YR 6/2 (SW) Same as 18-20'	100% recovery
	22		12, 15, 15, 16	10YR 6/2 (SW) Same as 18'-22'	100% recovery
	24		11, 20, 20, 16	10YR 6/2 (SW) Same as 18'-24'	100% recovery
	26				

COMMENTS: Boring terminated at 25.0 FEET
Field screening results indicate no gamma radiation or VOCs detected.

WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY	WELL NUMBER: RS3-1
LOCATION: WATERTOWN, MA	PAGE 2 OF 2
WORK ORDER NUMBER: 2281-11-01	

	DRILLING EQUIPMENT	
DRILLING CONTRACTOR: R & R INTERNATIONAL, INC		
DRILLING DATES: 12-11-91	DRILL RIG	DAVEY KENT
INSPECTOR: Stephen Lawlor	SAMPLER	1 3/8 " SPLITSPOON
BOREHOLE DEPTH: 28.0 FT. BELOW GROUND SURFACE	HAMMER WEIGHT	140 lb
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING	LENGTH OF FALL	30"
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL		
GROUNDWATER ELEVATION: NA FT. AMSL		

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24		11 20 20 15	10yr 6/2 (SW) Same as 15-24'	100% recovery
	26		13 9 31 23	10yr 5/2 Saturated, firm, good plasticity unit of m F. Sand (SW)	100% recovery
	28				
	30				
	32				
	34				
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: Boring terminated at 28.0 feet
Field screening results indicate no gamma radiation or VOC's detected.

WESTON

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ROY F. WESTON, INC.	WELL LOG
CLIENT: Army Materials Technology Laboratory	WELL NUMBER: RFW-12SB2
LOCATION: Watertown, MA	PAGE 1 OF 2
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R & R International, Inc
DRILLING DATES: 10-17-91
INSPECTOR: Stephen Lawler
BOREHOLE DEPTH: 30. FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	0		9 32 39 4	0-0.5 10yr-3/1 F Sandy loam topsoil 0.5-2.0 No sample recovery.	25% recovery
	2		7 9 7 5	10yr-3/1 Moist low plasticity (SW) soft F to M Sand	25% recovery
	4 5		7 7 5 3	10yr 3/1 Saturated low plasticity, loose (SM) F. Sand and silt with 20% C. Sand and 10% rounded Gravel fly ash mixed in with soil.	50% recovery
	6		4 2 3 4	SM 10yr-3/1 Saturated loose, low plasticity F. Sand and silt with 30% C Sand and 10% rounded Gravel.	25% recovery
	8		10 10 27 30	8-9.7' 10yr 3/2 Saturated, low plasticity (SW) loose F-M-C Sand 9.7-10' 10yr 5/4 Moist soft, nonplastic (SW) C. Sand with 10% Med Sand.	70% recovery
	10		25 21 23 31	10yr 6/4 Moist soft nonplastic (SW) C. Sand with 10% M Sand.	70% recovery
	12		15 41 36 22	10yr 5/3 Moist firm nonplastic (SW) M to C Sand with 10% subangular Gravel.	90% recovery
	14 15		20 40 32 26	10yr-6/4 Moist loose, nonplastic (SW-SM) M to C Sand with 30% F Sand and 10% subangular Gravel	90% recovery
	16		26 53 33 24	10yr-6/3 Moist loose nonplastic F-M-C Sand	40% recovery
	18		13 15 20 7	18-18.6 Saturated 10yr 5/3 low (SW) plasticity, firm, F-M-C Sand 18.6-20 10yr-6/4 Moist nonplastic (SW) soft M-C Sand with 20% subangular Gravel.	90% recovery
	20		14 26 20 20	10yr 5/3 Same as 18.6'-20' (SW)	60% recovery
	22		16 22 24 40	10yr-5/3 Same as 18.6'-22' (SW)	75%
	24 25		41 37 36 37	10yr 6/3 (SW) Same as 18.6'-2	70%

COMMENTS:

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-125B2
PAGE: 2 OF 2

DRILLING CONTRACTOR: R & R International, Inc
DRILLING DATES: 10-17-91
INSPECTOR: Stephen Lawlor
BOREHOLE DEPTH: 30 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	26		23 20	26-27.7' 10yr 5/... [illegible] plasticity, silt (SP) fine Sand 27.7-... 10yr 5/..., Same as 26-27.7' (SP)	80% recovery
	28		14 20 8 10	5y 4/3 Saturated, high plasticity (MH) firm, uniform Silt with 10% Fine Sand Visible petroleum contamination from 28.9' to 29.2'.	100% recovery HNu - 10 units
	30			End of Boring 30'	

COMMENTS: Unless otherwise noted, field-screening results indicate no detectable gamma radiation or VOCs.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: 12-SB-3
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: [illegible]
INSPECTOR: [illegible]
BOREHOLE DEPTH: [illegible] FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		9, 15, [illegible], 21	0-0.2 [illegible] 10[illegible]-3/1 Silt, nonplastic, moist [illegible] sand [illegible] and 10% angular gravel (SP)	75% recovery
	2–4		[illegible], [illegible], 27	10[illegible]-4/4 Moist nonplastic, soft [illegible] M Sand with 5% angular gravel. (SW)	50% recovery
	4–6		9, 21, [illegible], 36	[illegible] 10y-3/2 Moist soft nonplastic F to M Sand 5% angular gravel [illegible] 7/3 F-M Sand [illegible] Silt 20% [illegible] angular gravel (SW)	90% recovery
	6–8		59, 60, 69, 34	10y-8/6 Moist, soft nonplastic F-M-C Sand with 10% Silt and 25% angular Gravel (SW-SM)	70% recovery
	8–10		23, 36, 45, 51	10y-6/3 [illegible] soft, nonplastic fine-M-C Sand, 10% Silt (SW-SM)	75% recovery
	10–12		36, 57, 57, 54	10y-6/6 Moist nonplastic, soft, F-M-C Sand with 10% Silt [illegible] angular gravel (SW-SM)	70% recovery
	12–14		50, 51, 38, 44	10yr7/6 Moist nonplastic soft F-M-C Sand with 10% Silt and 25% angular Gravel (SW-SM)	55% recovery
	14–16		35, 32, 25, 19	10y-5/8 Moist nonplastic soft F-M-C Sand with 10% Silt and 10% Subangular Gravel (SW-SM)	75% recovery
	16–18		27, 27, 18, 21	16-17.5 10yr 5/6 Same as 14'-16' (SW-SM). 17.5-18 10y-7/6 Saturated, low plasticity soft Silt with 20% F. Sand and [illegible] (ML)	60% recovery
	18–20		9, 10, 18, 12	10y-5/6 Moist, M plasticity, soft Silt with [illegible]% Fine Sand and 20% Clay (MH)	90% recovery
	20–22		10, 14, 14, 20	10yr5/4 Saturated high plasticity soft Silt and Clay with 10% Fine Sand (MH)	90% recovery
	22–24		5, 15, 14, 14	Same as 20'-22' (MH)	90% recovery
	24			24 feet End of Boring	

COMMENTS: Boring terminated at 24 feet
Field screening results indicate no gamma radiation or VOCs in soil.

WESTON

2B

ROY F. WESTON, INC. CLIENT: Army Materials Technology Laboratory LOCATION: Watertown, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: RFW-11SB-2 GRSB-14 PAGE 1 OF 1

DRILLING CONTRACTOR: R & R International, Inc
DRILLING DATES: 10-14-91
INSPECTOR: Stephen Lawlor
BOREHOLE DEPTH: 26. FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
No well installed	0			Ground Surface 0-0.5 Asphalt Layer	
		S#1	20 28 20	(SP) munsell 10yr 2/2 Dry Coarse Sand with 20% rounded Gravel	70% recovery
	2	S#2	12 18 26 26	(SP) 10yr 3/3 Dry Coarse Sand SM Dry soft fine to med Sand with 20% angular Gravel. 10yr 3/3	20% recovery
	4 5	S#3	38 32 30 57	(SP) Coarse Sand with 20% rounded Gravel. 10 yr 5/6	90% recovery
	6	S#4	50/3"	10yr 7/2 Dry loose med to (SP) coarse Sand with 20% angular Gravel.	100% recovery
	8	S#5	60/4"	10yr 3/3 Moist, firm, low plasticity fine Sand and (SM) silt with 20% Coarse Sand Subangular Gravel.	100% recovery
	10	S#6	60/0"	No recovery core-barrel refusal.	No recovery
	13	S#7	100/10"	No recovery core-barrel refusal.	No recovery
	15	S#8	9 39 26 30	10yr 6/6 Dry f-m Sand (SP-SM) Dry, soft C. Sand with 10% rounded Gravel and 10% F. Sand	100% recovery
		S#9	24 38 100/5"	10yr 6/6 Dry soft, C. Sand (SP-SM) with 10% rounded Gravel and 10% F. Sand	100% recovery
	18	S#10	51 55 33 29	10yr 6/3 Dry soft F. to m (SP-SM) Sand with 30% rounded Gravel	100% recovery
	20	S#11	30 32 33 23	10yr 6/4 Dry soft m to C Sand SP-SM with 10% rounded Gravel Sharp Contact	100% recovery
	23	S#12	21 27 27 24	10yr 6/4 Moist, Firm (ML) low plasticity F Sand and Silt	80% recovery
	25 26	S#13	21 20 20 20	10yr 6/6 Firm saturated graded F. Sand with 20% M. Sand	End of Boring 26'

COMMENTS: All HNu and RAD readings were at background. Boring terminated at 26'.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

![WESTON logo]

ROY F. WESTON, INC.
CLIENT: ARMY MATERIALS TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-11SB3
PAGE 1 OF 2

DRILLING CONTRACTOR: RTR International, Inc.
DRILLING DATES: 10-14-91
INSPECTOR: STEPHEN LAWLOR
BOREHOLE DEPTH: 34.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
No well installed	0			Ground Surface Asphalt	
	0–2		13, 23, 27	(ML) 10yr 3/6 Soft Silt with 20% C Sand (SP) 10yr 5/6 Dry C. and M. Sand with 20% rounded Gravel	90% recovery
	2–4		30, 37, 52/	(SP) 10yr 6/2 Dry, Soft F. to C. Sand with 20% rounded Gravel	100% recovery
	4–6		43, 57, 80, 82	(SP) 10yr 6/2 Dry, soft, F to C. Sand with 30% rounded pebbles	90% recovery
	6–8		50/2"	No Recovery	No recovery
	8–10		12, 18, 32, 54	(SP) 10yr 5/3 Soft, Graded fine to coarse Sand with rounded Gravel, Dry.	90% recovery
	10–12		20, 11, 17, 20		90% recovery
	12–14		11, 13, 17, 20	Moist 10yr 6/4 M to C (SP) Sand with 10% F. Sand.	90% recovery
	14–16		15, 23, 27, 36		100% recovery
	16–18		16, 50/3"	10yr 6/2 Dry, loose F to m Sand (SW) 10yr 6/4 Moist, loose M. to C. Sand.	100% recovery
	18–20		28, 50/5"	(SP-SM) 10yr 6/4 Moist, soft M to C Sand with 10% F. Sand and 10% rounded Gravel.	100% recovery
	20–22		12, 15, 18, 33	(SP) 10yr 6/3 Dry, firm, F. to m. Sand with 30% rounded Gravel.	90% recovery
	22–24		15, 25, 33, 26	(SW) 10yr 7/2 Dry, soft F. Sand with 20% med Sand 10yr 6/6 Moist, soft F-m-c Sand (graded).	100% recovery
	24–26		18, 11, 16, 19	(ML) 10yr 7/2 Dry, soft Silt w 10% F. Sand and 10% round Gravel SW 10yr 5/4 Dry C. Sand w 10% F. Sand	90% recovery

COMMENTS: No volatiles detected using HNu for Field screening. All RAD Field screening results were at background.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-11SB-3
PAGE 2 OF 2

DRILLING CONTRACTOR: R + R International, Inc.
DRILLING DATES: 10-14-91
INSPECTOR: Stephen Lawlor
BOREHOLE DEPTH: 34.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split-spoon
HAMMER WEIGHT	140 lb.
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
No well installed	26		11, 16, 19	SW 10yr 7/3 Dry, soft Silt with 10% F. Sand and 10% round Gravel	85% recovery
			18, 12, 15, 14	ML 10yr 7/2 Nonplastic Silt with 10% F to M Sand and 10% Gravel SP 10yr 5/6 Dry C Sand with 10% F to M Sand.	90% recovery
			15, 11, 12, 14	SP 10yr 6/4 Moist, soft, nonplastic M to C Sand w/ 10% F. Sand	100% recovery
	30		13, 13, 17, 17	SP 10yr 5/6 Moist low plasticity F. Sand loose 10yr 6/6 Moist soft F-M-C Sand	100% recovery
			11, 11, 9, 9	SP 10yr 6/6 Saturated firm low plasticity F-M-C Sand.	100% recovery
	35			End of boring 34'	
	40				
	45				
	25				

COMMENTS: Soils field screened with H-Nu photo ionization meter and micro R meter. All field screening results indicate no contaminants were detected.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

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WESTON

ROY F. WESTON, INC. CLIENT: Army Materials Technology Laboratory LOCATION: Watertown, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: RFW-11SB-4 PAGE 1 OF 3

DRILLING CONTRACTOR: R+R International, Inc DRILLING DATES: 10-15-91 INSPECTOR: Stephen Lawler BOREHOLE DEPTH: 70.0 FT. BELOW GROUND SURFACE WELL DEPTH: 67.1 FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL GROUNDWATER ELEVATION: FT. AMSL	DRILLING EQUIPMENT: DRILL RIG: Davey Kent; SAMPLER: 1 3/8" split spoon; HAMMER WEIGHT: 140 lbs.; LENGTH OF FALL: 30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW-20 installed. See well log for well construction details.	0		4, 12, 10, 14	0-0.5 10yr 3/2 Moist, soft, m plasticity Silt with 10% F. Sand. 0.5-2.0' 10yr 5/1 Moist, low plasticity, Firm F-M Sand (SM-ML) with 10% Gravel and 10% Silt	70% recovery
	2		10, 8, 6, 5	(SW) 10yr 5/1 Dry, loose non plastic M to C Sand with 10% rounded ~~Gravel~~ to subangular Gravel	25% recovery
	4		20, 7, 5, 3	(SM) 10yr 3/1 Moist, loose, moderate plasticity F to M Sand with 20% Silt.	75% recovery
	6		10, 18, 32, 37	6-6.3 10yr 3/ Moist, loose, m plasticity Fine to med Sand with 20% Silt. 6.3-8' 10yr 6/6 Dry, loose, non plastic (SW) F-M-C Sand with 20% Gravel	30% recovery
	8		22, 40, 44, 57	(SW) 10yr 5/6 moist, non plastic, soft M to C Sand with 20% sub-angular gravel.	50% recovery
	10		19, 21, 21, 25	(SW) 10yr 7/4 Moist non plastic ~~silt~~ med to coarse Sand with 20% rounded Gravel	~~100%~~ recovery 50%
	12		13, 17, 18, 16	(SP) 10yr 5/3 Moist non plastic, soft M to C uniform Sand	50% recovery
	14		10, 14, 19, 20	(SP) 10yr 6/3 Moist, Firm, non-plastic, uniform, M to C Sand	100% recovery
	16		40, 47, 24, 25	(SP) 10yr 6/4 Moist low plasticity F-M-C Sand with 20% sub-angular Gravel	100% recovery
	18		16, 23, 30, 19	18-18.5 10yr 6/6 Moist, soft, non-plastic, uniform med Sand (SP). 18.5-20 10yr 6/4 Moist, loose, non-plastic MC Sand, 10% ang Gravel (SW)	30% recovery
	20		23, 37, 40, 46	(SW) 10yr 6/6 Moist, firm, non plastic M to C Sand with 20% sub-angular Gravel	85% recovery
	22		24, 17, 15, 15	(SW) 10yr 5/6 Moist, Firm, non plastic M to C Sand with 5% rounded Gravel	70% recovery
	24		9, 9, 16, 26	(SP) 10yr 5/4 Moist, Firm, non-plastic, uniform, M to C Sand	80% recovery

COMMENTS: 11SB4 Drilled at MW-20
Field screening results indicate no detectable gamma radiation or VOC in soil samples.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC. CLIENT: Army Materials Technology laboratory LOCATION: Watertown, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: RFW-11SB-4 PAGE 2 OF 3

DRILLING CONTRACTOR: R+R International Inc. DRILLING DATES: 10-15-91 INSPECTOR: Stephen Lawlor BOREHOLE DEPTH: 70.0 FT. BELOW GROUND SURFACE WELL DEPTH: 57.1 FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL GROUNDWATER ELEVATION: FT. AMSL	DRILLING EQUIPMENT DRILL RIG: Davey Kent SAMPLER: 1 3/8" split spoon HAMMER WEIGHT: 140 lbs LENGTH OF FALL: 30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW-20 installed See well log for well construction details.	26		16, 26		
			26, 32, 34, 38	10YR 7/2 Moist [illegible] nonplastic M to C Sand with 10% round[ed] Gravel (SW)	70% recovery
	28		26, 29, 39, 38	10YR 5/4 Dry, [illegible] nonplastic M to C Sand with [illegible] sub-angular Gravel (SW)	[illegible]
	30, 31		23, 25, 36, 48	[illegible] 5 - Dry, Firm nonplastic M to C Sand with 20% sub-angular Gravel (SW)	[illegible]
	32		44, 22, 25, 26	10YR 6/4 Moist, soft, nonplastic M to C Sand.	80% recovery
	34, 36		14, 13, 15, 30	10YR 5/4 Saturated firm, non-plastic M to C Sand (SW)	100% recovery
	40, 41		48, 64, 43, 39	40-40.8 10YR [illegible]/4 Saturated loose [illegible] M to C Sand and Gravel (SW)	100% recovery
	42			40.8-42 10YR 4/3 Saturated, loose non-plastic poorly sorted F to M Sand (SW)	
	45, 46, 47		11, 17, 19, 22	10YR 4/2 Saturated non plastic M to C Sand (SW)	100% recovery
	49, 50		15, 10		

COMMENTS: Begin using 5-foot sample interval at 30 feet.
11SB4 Drilled at MW-20
Field screening results indicate no detectable gamma or VOC's.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: Army Materials Technology Laboratory	WELL NUMBER: RFW-II53-4
LOCATION: Watertown MA	PAGE 3 OF 3
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R T & R International Inc.
DRILLING DATES: 10-15-91
INSPECTOR: Stephen Lawor
BOREHOLE DEPTH: 70.0 FT. BELOW GROUND SURFACE
WELL DEPTH: 57.1 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" split spoon
HAMMER WEIGHT	140 lbs.
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW20 installed. See well log for well construction details.	50		15, 10, 13, 20	10YR 5/4 Saturated, non plastic F to M Sand (SW)	100% recovery
	52				
	55		37, 50/3"	Sand running into augers prevents sample from being collected	100% recovery
				Sand Contact (Till)	
	60		30, 35, 46, 42	60-61.8 M-C sand flowing into augers. 61.8-62' Saturated Firm, no plasticity; poorly sorted f. Sand and Silt with 20% M Sand and 5% angular Gravel (Till). Based on resistance during drilling, driller believes till first encountered at 57 feet. (SM)	100% recovery
	65				
	70			End of boring at 70'. Unable to obtain split-spoon sample due to sand flowing up into augers.	
	75				

COMMENTS: II53-4 Drilled at MW-20
Field screening results indicate no detectable gamma radiation or VOCs.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 1356-6 GRSB-18
PAGE 1 OF 5

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-26-91
INSPECTOR: STEVE LAWLOR
BOREHOLE DEPTH: 108 FT. BELOW GROUND SURFACE
WELL DEPTH: 98.4 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW-19 A installed. See well log for well construction details.	0–2		2, 3, 2, 3	10YR 3/2 MOIST, FIRM, LOW PLASTICITY Fine Sand and SILT (TOPSOIL) (SM-PT)	45% recovery
	2–4		3, 4, 17, 19	10YR 6/6 SOFT, MOIST, NONPLASTIC MED to COARSE SAND, 10% subangular gravel (SP)	50% RECOVERY
	4–6		9, 29, 34, 40	10YR 6/4 Dry, SOFT, nonplastic med to coarse sand, 20% subangular gravel. (SP)	70% recovery
	6–8		38, 53, 49, 64	10yr 6/4 Firm, MOIST, NONPLASTIC MEDIUM to COARSE SAND, 20% subangular gravel. mottled soil (SP)	80% recovery
	8–10		14, 35, 46, 59	10YR 6/4 Firm, MOIST, nonplastic FINE-COARSE sand, 10% subangular gravel. (SW)	90% recovery
	10–12		17, 29, 27, 38	10yr 6/4 SOFT, nonplastic, dry medium to coarse sand, 20% subangular gravel. (SP)	85% recovery
	12–14		23, 25, 13, 18	10yr 6/3 Loose, nonplastic, Dry COARSE SAND and gravel, 20% med SAND (SP)	90% recovery
	14–16		9, 11, 17, 21	10YR 6/3 SOFT, ~~dry~~ moist, nonplastic MEDIUM to COARSE SAND (SP)	80% recovery
	16–18		10, 23, 37, 48	10YR 6/3 SOFT, MOIST, NONPLASTIC MED-COARSE SAND, 10% rounded gravel. (SP)	75% recovery
	18–20		17, 24, 17, 27	10yr 6/6 Loose, moist nonplastic MED (20%) - COARSE SAND and gravel (subangular) (SP)	100% recovery
	20–22		11, 13, 37, 44	10YR 6/4 MOIST, nonplastic, SOFT MEDIUM SAND, 20% COARSE SAND. (SP)	80% recovery
	22–24		15, 13, 27, 19	10YR 6/3 SOFT, moist, nonplastic MEDIUM to COARSE SAND, 10% subangular gravel (SP)	90% recovery

COMMENTS: 0-34' 10-26-91 Drill with 4 1/4" Augers Davey Kent rig
34-55' 11-9-91 Drill with 10 1/4 augers CME rig
55-108' 11-24 - 11-25-91 Drill with Barber air-rotary rig.

WESTON

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ROY F. WESTON, INC.
CLIENT: Army Materials Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: RFW-13SB2
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R International, Inc
DRILLING DATES: 10-16-91
INSPECTOR: Stephen Lawlor
BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8" Split Spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
	0–2		3, 10, 25, 17	0-0.5' [illegible] Sand-Silt topsoil 0.5-2.0 [illegible] Moist low plasticity [illegible] C. Sand with [illegible]% Silt and SW-SM 20% subangular Gravel.	75% recovery
	2–4		25, 36, 37, 34	[illegible] 7/3 Dry loose nonplastic M to (SW) C Sand with 30% Subangular to [illegible] Gravel	60% recovery
	4–6		50, 27, 27, 27	4-4.5' [illegible] Moist [illegible] (SM) F. Sand and Silt 20% [illegible] 4.5-6 [illegible] 6/4 Dry [illegible] (SW) to C Sand with 30% rounded Gravel	100% recovery
	6–8		42, 50/5"	[illegible]yr 6/4 Moist, nonplastic, [illegible] (SW) M-C Sand with 20% subangular gravel	100% recovery HNu-1.0 unit *
	8–10		50/0"	No Sample, spoon refusal	NA
	10–12		26, 16, 13, 20	10yr-5/3 Moist nonplastic. (SW) firm F-M-C sand with 20% subangular gravel	80% recovery
	12–14		23, 13, 16, 20	[illegible]y-6/6 Moist nonplastic soft (SW) M-C Sand	50% recovery HNu-.0 unit *
	14–16		36, 33, 19, 24	[illegible]yr [illegible] Moist, loose, nonplastic (SW) M-C Sand	50% recovery HNu-1.0 unit *
	16–18		30, 17, 24, 28	10yr 6/3 Moist soft nonplastic (SW) F-M-C Sand with 5% Subangular gravel	70% recovery HNu-1.0 unit *
	18–20		12, 19, 17, 24	10y-5/4 Moist, soft, low plasticity (SW) F-M-C Sand with 5% Subangular Gravel	70% recovery HNu-1.[illegible] units *
	20–20.5			20-20.5' Drilling error, no sample	NA
	20.5–22		30, 53, 39	20.5-22' [illegible] 6/4 Moist soft low (SW) plasticity F-M-C Sand with [illegible]% Subangular Gravel	100% recovery HNu-1.2 units *
	22–24		36, 30, 20, 22	22-23.5 10yr 6/4 Moist, soft, L plastic (SW) F-M-C Sand [illegible]-24 10y-5/3 Saturated low plastic SW-SM Fine sand with [illegible]% silt; firm.	80% recovery HNu-1.9 units *
	24–26		12, 15, 15, 17	10yr 5/3 Saturated firm, nonplastic (SW) F Sand with 10% M. Sand.	90% recovery HNu-1.8 units *

COMMENTS: End of boring at 26 feet
* Elevated HNu readings appear to be due to moisture in soil
All Gamma radiation field-screening results at background levels.

FIGURE A3-2 BOREHOLE/WELL LOG SHEET

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 1353-3
PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: 10-11-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 27.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		4, 2, 3, 4	0-0.5 10yr-3/2 Fine sandy loam topsoil 0.5-2' 10yr-3/2 Dry, loose sandy silt (ML)	25% recovery
	2–4		9, 5, 8, 12	Same as 0.5' to 2.0' (ML)	50% recovery
	4–6		18, 36, 40, 58	4-4.5' Same as 0.5' to 4.0' (ML) 4.5-5' 10yr-5/1 Dry loose nonplastic (SP) fine Sand with Cobbles.	50% recovery
	6–8		54, 54, 41, 45	10yr-6/1 Dry, loose, nonplastic (SP) Sand with gravel and cobbles.	75% recovery
	8–15			(SP) 8' to 15' Cobbles & Boulders in sand, no samples collected.	
	15–16		28, 50/3"	15-16' Same as 6-8'. (SP)	50% recovery
	17–19		17, 20, 22, 22	17-17.4 Dry, loose nonplastic coarse Sand (SP) w some gravel 10yr 4/3 17.4-18 10yr-6/3 Dry loose nonplastic (SW)-Well graded [illegible] F. Sand	50% recovery + HNu-Sniff
	19–21		13, 15, 21, 24	Same as 17.4' to 18' (SW)	100% recovery
	21–23		2?, 22, 20	10yr-6/4 Same as 17.4' to 21' (SW)	100% recovery HNu-Sniffs
	23–25		6, 8, 15, 16, 8	Same as 17.4' to 23' (SW)	50% recovery

COMMENTS: Unless otherwise indicated, field screening results for gamma radiation and VOCs at background.

WESTON

ROY F. WESTON, INC.
CLIENT: Army Material Technology Laboratory
LOCATION: Watertown, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 353-3
PAGE 2 OF 2

DRILLING CONTRACTOR: R & R International, Inc.
DRILLING DATES: 10-11-91
INSPECTOR: Greg Hall
BOREHOLE DEPTH: 27 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	Davey Kent
SAMPLER	1 3/8' split spoon
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24				
	25		10	(SW) Same as 17.4' to 25'	100% recovery
			20		
	26		16	Soil becomes saturated at 25 feet.	
	27		21		
				End of Boring - 27'	
	28				
	30				
	32				
	34				
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: Unless otherwise indicated field screening results for gamma radiation and VOCs at background.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 14SB-1 GRSB-16
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-25-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 25 FT. BELOW GROUND SURFACE
WELL DEPTH: 24.5 FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: FT. AMSL
GROUNDWATER ELEVATION: FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
MW-18 installed. See well log for well construction details.	0–2		3, 5, 6, 4	upper .5': 10YR 6/4 fine and med SAND, trace coarse sand. Dry, nonplastic, loose (SP). Lower .7' 10YR 3/3 Dry, nonplastic, loose SILT and fine SAND, trace med-coarse sand, trace organic matter (SM-ML)	50% RECOVERY
	2–4		5, 4, 3, 3	no recovery. Rock in sampler tip	no recovery
	4–6		5, 2, 7, 5	10YR 3/2 Fine SAND and SILT, trace organics (SM-ML)	25% recovery
	6–8		6, 5, 7, 10	10YR 5/3 Dry, nonplastic, loose Poorly sorted SAND, 10% rounded gravel. upper bottom .3' contained 20% SILT (SW-SM)	HNU = 2 units in Sixty wager; 40% recovery
	8–10		9, 12, 10, 11	upper .4': same as above. Lower .6' 10YR 5/4 poorly sorted sand, 10% gravel. Dry, nonplastic, loose (SW)	50% recovery
	10–12		24, 27, 11, 20	10YR 5/4 Dry, nonplastic, loose poorly sorted sand, 10% gravel, .3ft layer of "coal" or "ash". (SW)	HNU: 2ppm in "coal" or "ash" layer. 45% recovery
	12–14		7, 11, 10, 19	10YR 5/3 Dry, nonplastic, loose, poorly sorted sand, 30% silt, 10% subang gravel. (SM)	15% recovery
	14–16		12, 6, 6, 9	10YR 6/4 moist, non plastic, soft Fine SAND, trace(?) silt (SW)	50% recovery
	16–18		8, 8, 9, 8	10YR 6/4 WET-SATURATED, non plastic, soft Fine SAND, trace (?) silt, orange mottling evident throughout sample. (SW)	HNU: .5 units; 80% recovery
	18–24				
	24–25			End of boring 25; no split-spoon sample collected	

COMMENTS: Boring terminated at 18'
Bottom of fill encountered at 10.6'
All rad readings at background levels.
End continuous split-spoon sampling at water table; 15'.

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WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY	WELL NUMBER: LSSB-1 GRSB-20
LOCATION: WATERTOWN, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-26-91
INSPECTOR: TIM WARR/STEVE LAWLOR
BOREHOLE DEPTH: 10 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		4, 3, 4, 5	10YR 5/5 SOFT, Dry, LOW PLASTICITY Fine SAND, 10% Silt, 10% subangular gravel (ST)	50% RECOVERY
	2–4		5, 5, 9, 14	10YR 3/2 SOFT, moist, low-mod PLASTICITY SILT, 10% Fine sand, 10% subangular gravel.	50% recovery
	4–6		15, 15, 11, 7	no RECOVERY	no RECOVERY
	6–8		6, 3, 2, 3	no RECOVERY	no RECOVERY
	8–10		5, 3, 5, 6	10YR 6/2 SOFT-FIRM, SATURATED, LOW PLASTICITY Fine SAND, 10% SILT	75% recovery
	10			End of boring 10'	
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 10'
All HNU and RAD readings at background levels
NO FILL ENCOUNTERED

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 15SB-2
PAGE / OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC
DRILLING DATES: 10-26-91
INSPECTOR: STEVE LAWLOR / TIM WARR
BOREHOLE DEPTH: 6 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		3, 7, 8, 11	upper .9': 10yR 3/3 SOFT, Dry, LOW PLASTICITY (SP-SM) FINE SAND, 10% SILT lower .5': 10yr 3/2 SOFT, MOIST, med plasticity (SM) SILT w/ 40-50% fine sand. Ash layer at 1.1-1.6'.	HNU = 0.2 75% recovery
	2–4		10, 11, 10, 10	NO RECOVERY, ROCK FRAGMENT IN SAMPLER TIP.	NO RECOVERY
	4–6		5, 2, 2, 1	10yr 5/2 FIRM, SATURATED, LOW PLASTICITY FINE SAND, 10% med sand, 10% SILT (SP-SM)	HNU = 0.2 80% recovery
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS:
- Boring terminated @ 6'
- All HNU and RAD readings at background levels
- no FILL ENCOUNTERED

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 17SB-1
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-24-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 8 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT

DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		10, 15, 12, 18	10YR 4/4 SOFT, MOIST, NONPLASTIC Fine - coarse sand, 25% sl-ang gravel, trace silt & organics. brick & metal frags present (SW)	HNU = 0.1 units; 40% recovery
	2–4		6, 7, 5, 2	10YR 3/2 soft, moist, nonplastic fine - coarse sand, 5% sl-ang gravel 15% organics (SW)	30% recovery
	4–6		1, 1, 2, 1	NO RECOVERY	NO RECOVERY
	6–8		1, 2, 2, 1	10YR 3/2 FIRM, SATURATED, HIGH PLASTICITY CLAY, ~40% SILT, trace fine sand and organics. 1-2 mm organic lamination every 4-6 mm (OH)	50% recovery
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 8'
END OF FILL ENCOUNTERED at 6.3'
ALL RAD readings at background levels.

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 1758 2
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-24-91
INSPECTOR: TIM WARR
BOREHOLE DEPTH: 10 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	$1^3/8$" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		16, 20, 15, 19	10yr 4/3 SOFT, MOIST, NONPLASTIC, FINE TO COARSE SAND, TRACE SILT, TRACE GRAVEL. ASH LAYER .1' thick & concrete/mortar material .2' thick (SW)	60% recovery
	2–4		17, 15, 21, 24	10yr 3/1 SOFT, MOIST, nonplastic Fine to coarse sand, trace fine gravel (SW)	75% recovery
	4–6		14, 19, 17, 20	10yr 3/1 SOFT, MOIST, NON PLASTIC FINE TO COARSE SAND, TRACE SILT, trace subangular gravel. .2' thick coal frag lay @ 5.8' (SW)	HNU = 0.2 units; 70% recovery
	6–8		17, 4, 1, 1	10yr 3/2 SOFT, SATURATED, MODERATE plasticity SILT, 25% clay, 10% organics. 1-2 mm thin organic lamination every 5-10 mm. (OL-OH)	25% recovery
	8–10		2, 1, 2, 1	10yr 3/1 SOFT, SATURATED, HIGH PLASTICITY SILT, 40% CLAY, 15% organics (roots) (OL-OH)	85% recovery

Depth scale (feet): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

COMMENTS: Boring terminated @ 10'
End of Fill encountered at 6.5'
All RAD readings at background levels

WESTON

ROY F. WESTON, INC.

CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY

LOCATION: WATERTOWN, MA

WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: 18SE-1

PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.

DRILLING DATES: 10-28-91

INSPECTOR: STEVE LAWLOR

BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE

WELL DEPTH: NA FT. BELOW TOP OF PVC CASING

ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL

GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		4, 3, 5	10yR 6/6 loose, Dry, nonplastic, fine to medium sand (upper .5') 10yR 3/3 loose, Dry, mod plasticity (SP)	
	2		8, 10, 8, 10	10yR 6/3 STIFF, Dry, MODERATE PLASTICITY SILT and FINE SAND, 10% subangular gravel. (SM)	75% recovery
	4		4, 5, 9, 10	10yR 5/3 STIFF, Dry, MODERATE PLASTICITY SILT and FINE SAND, 10% subangular gravel (SM)	70% recovery
	6		7, 6, 7, 14	upper 1.5' SAME AS ABOVE (SM) lower 10yR 5/6 Firm, DRY, LOW PLASTICITY FINE SAND, 20% SILT (SM)	70% recovery
	8		7, 17, 14, 15	10yR 5/2 FIRM, DRY, MODERATE PLASTICITY SILT, CLAY, and fine SAND (ML-CL)	100% recovery
	10		4, 5, 10, 13	10yR 4/4 STIFF, MOIST, High PLASTICITY SILT and CLAY, 10% fine sand, 10% angular gravel (ML-CL)	60% recovery
	12		21, 14, 6, 9	10yR 5/4 STIFF, MOIST, HIGH PLASTICITY SILT and CLAY, mottling present (CL)	60% recovery
	14		10, 14, 15, 20	10yR 5/3 STIFF, SATURATED, low PLASTICITY FINE SAND, 10% SILT, trace organics (ML)	55% recovery
	16				100% recovery
	18				
	20				
	22				
	24				

COMMENTS: Bottom of Boring at 16'

All HNu and RAD readings at background levels

NO FILL DEFINED

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: 17SB-3
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-24-91
INSPECTOR: TIM WARR
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		5, 7, 10, 12	10YR 3/2 SOFT, moist, non plastic Fine-coarse SAND, 20% silt, 20% organics, roots. (topsoil) (SM)	40% RECOVERY
	2–4		14, 17, 18, 20	10yR 6/4 soft, dry, nonplastic Fine-medium sand, 25% silt, 3% subang gravel (SM)	5% recovery
	4–6		13, 23, 20, 20	10YR 5/4 soft, moist, nonplastic (SM) Fine-coarse SAND, trace silt, trace sub-angular gravel	75% recovery
	6–8		14, 10, 12, 7	10yR 6/4 soft, dry, nonplastic Fine SAND, 15% silt, 5% subangular gravel. Silty clay in tip of spoon (SM-SP)	Hnu = 0.2 units; 75% recovery
	8–10		7, 7, 5, 6	10yR 4/2 soft, moist, high plasticity Silt, 40-50% clay. (CL-CH)	20% recovery
	10–12		5, 5, 6, 5	Upper .4': same as above. Lower .3': 10yR 6/8 soft, moist, nonplastic fine to medium SAND, trace silt, trace subrounded gravel	25% recovery
	12–14		3, 3, 5, 3	5y 3/1 soft, moist, highly plastic Clay, 30-40% SILT (CH)	Hnu = 0.2 units; 15% recovery
	14–16		1, 2, 3, 3	5y 4/1 soft, moist-saturated, high plastic CLAY, 30-40% silt, trace organics (CH-OH) 1-3mm fine sand/silt beds every 5-10mm	100% recovery
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 16'. All RAD readings at background levels.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-1
PAGE / OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10/27/91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 10 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		8, 8, 10, 9	upper .5' loamy topsoil; lower .5' 10yr 5/3 dry, loose, nonplastic poorly sorted sand and SILT, 10% angular gravel (SM)	50% recovery
	2–4		8, 17, 8, 6	10YR 5/3 Dry, loose, nonplastic Poorly sorted SAND, 10% SILT, Angular gravel. (SW-SM)	50% recovery
	4–6		8, 4, 3, 2	10yR 5/3 Dry, loose, nonplastic poorly sorted SAND, 10% SILT, Angular gravel (SW-SM)	50% recovery
	6–8		2, 3, 2, 2	no recovery	no recovery
	8–10		3, 2, 2, 2	2.5y 6/6 SATURATED, low plasticity, soft SILT, 25% fine Sand, trace med-coarse sand .4' Thick layer of organic silt. (ML-OL)	50% recovery
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 10'
ALL HNU and RAD readings at background levels
NO FILL ENCOUNTERED

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-2
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-27-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT

DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		10, 13	0-.7' Concrete flooring .7'-2' ~~10yr 5/6 loose, dry nonplastic~~ upper .5' - loamy topsoil, loose, dry, nonplastic lower .8': 10yr 5/6 fine-coarse sand, trace gravel. (SW)	90% recovery
	2–4		22, 27, 21, 29	10yr 5/6 loose, Dry, nonplastic fine-coarse sand, trace gravel (SW)	75% recovery
	4–6		29, 27, 10, 7	upper 1.6' same as above lower .4' 10yr 5/4 stiff-moist, mod. plastic clayey silt (3% clay) (ML)	100% recovery
	6–8		33, 37, 31, 29	10yr 6/3 dry-moist, loose, nonplastic 50% fine sand and 50% silt, grading to 80% fine sand with 20% med-coarse sand & subang gravel. (SM-SW)	75% recovery
	8–10		12, 16, 19, 12	~~10yr 5/6 upper~~ upper .6': 10yr 5/6 moist, soft, mod. plastic silt w/ 10% fine sand, trace clay. (ML) lower .6': 10yr 7/3 moist, loose, nonplastic fine to coarse sand w/ 50% subang gravel. (SW)	60% recovery
	10–12		8, 16, 16, 12	10yr 7/3 moist, loose, nonplastic fine to coarse sand w/ 50% subang gravel. (SW)	60% recovery
	12–14		28, 21, 15, 13	10yr 7/3 WET, loose, nonplastic fine to coarse sand w/ 50% subang gravel (SW)	40% recovery
	14–16		47, 34, 24, 19	10yr 7/3 saturated, loose, nonplastic fine to coarse sand w/ 50% subang. gravel (SW)	50% recovery
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 16'
All HNU and RAD readings at background levels.
No fill encountered.

WESTON

n]3

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-3
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-27-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 14 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		5, 5, 6, 8	upper .4' Loamy topsoil (SM-PT); Lower .8' 10yr 5/6 loose, dry, nonplastic fine-coarse sand, trace silt, trace gravel. (SW)	60% recovery
	2–4		6, 7, 6, 8	10yr 5/6 loose, dry, nonplastic fine-coarse sand, trace silt, trace gravel. (SW)	50% recovery
	4–6		7, 19, 34, 20	10yr 5/6 loose, dry, nonplastic, fine-coarse sand, trace silt, trace gravel (SW)	40% recovery
	6–8		33, 50/2	10yr 5/6 loose, dry, nonplastic, fine-coarse sand, trace silt, trace gravel (SW)	25% recovery
	8–10		30, 50/.	10yr 5/6 loose, dry nonplastic, fine-coarse sand, trace silt, trace gravel (SW)	25% recovery
	10–12		24, 21, 18, 11	upper .75ft - same as above; lower .35ft 10yr 5/4 clay with 35% silt, trace fine sand. moist, soft, mod plastic. (CL)	50% recovery
	12–14		9, 9, 9, 19	10yr 5/4 wet, soft, mod plastic clay with 20% silt, trace fine sand. (CL)	60% recovery
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 14'
All HNu and RAD readings at background levels
No fill encountered.

WESTON

ROY F. WESTON, INC. CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY LOCATION: WATERTOWN, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: GRSB-5 PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC. DRILLING DATES: 10-27-91 INSPECTOR: R. EICHHORN BOREHOLE DEPTH: 14.0 FT. BELOW GROUND SURFACE WELL DEPTH: NA FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL GROUNDWATER ELEVATION: NA FT. AMSL	DRILLING EQUIPMENT DRILL RIG: DAVEY KENT SAMPLER: 1 3/8" SPLIT SPOON HAMMER WEIGHT: 140 lb LENGTH OF FALL: 30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		2, 3, 5, 4	10yR 4/2 Loose, Dry, nonplastic LOAMY TOPSOIL, grass roots (SM - pt)	35% recovery
	2–4		5, 8, 5, 4	10yr 6/2 loose, dry, nonplastic 80% fine-coarse sand, 20% gravel, 10% brick fragments. (SW)	50% recovery
	4–6		3, 4, 9, 23	10yr 6/2 loose, dry, nonplastic 45% fine-coarse sand, 20% gravel 25% silt, 10% brick fragments. (SM)	50% recovery
	6–8		28, 50, 50/1	10yr 6/2 Loose, Dry, nonplastic 45% fine-coarse sand, 20% gravel 25% silt, 10% brick fragments (SM)	Hnu = .4 units 50% recovery
	8–10		50, 50/2	10yr 6/2 loose, Dry, nonplastic 45% fine-coarse sand, 20% gravel 25% silt, 10% brick fragments (SM)	Hnu = 1 unit 40% recovery
	10–12		11, 13, 17, 18	2.5y 5/2 firm, moist, mod. plasticity silty clay (30% silt, 10% fine sand) 1" thick interbeds of silt w/ 10% clay (CL)	60% recovery
	12–14		22, 30, 40, 27	2.5y 5/2 firm, ~~moist~~ SATURATED, mod plasticity silty clay (30% silt, 10% fine sand) 1" thick interbeds of silt w/ 10% clay.	80% recovery
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 14'.
All RAD READings at background levels
Bottom of fill encountered at 10'.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-6
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-27-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 14 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		6, 14, 12, 18	upper .5' 10yr 4/2 loamy topsoil, loose, dry, non-plastic (SM); lower .7' 10yr 5/6 loose, dry, nonplastic 70% fine-coarse sand, 20% subang gravel, 10% silt	60% recovery
	2–4		22, 44, 32, 34	10yr 5/6 loose, dry, nonplastic 70% fine-coarse sand, 20% subang gravel, 10% silt. (SW)	50% recovery
	4–6		23, 26, 30, 32	10yr 5/6 loose, dry, nonplastic 70% fine-coarse sand, 20% (SW) subang gravel, 10% SILT.	65% recovery
	6–8		37, 50/2	10yr 5/6 loose, dry, nonplastic (SW) 70% fine-coarse sand, 20% subang gravel, 10% silt	50% recovery
	8–10		30, 39, 34, 39	10yr 5/6 loose, dry, nonplastic 70% fine-coarse sand, 20% (SW) subang gravel, 10% silt.	60% recovery
	10–12		8, 18, 27, 28	10yr 4/4 loose-soft, wet-saturated, low plasticity 50% fine-coarse SAND, 50% SILT (SM)-(ML)	50% recovery
	12–14		27, 29, 18, 34	10yr 4/4 saturated, non-low plastic, loose (SM-ML) 50% fine-coarse sand, 50% silt	75% recovery
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 14'
All HNU & RAD readings at background levels
No fill encountered.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-7
PAGE / OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-30-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT

DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		6, 10, 20, 2	10yr 5/6 Dry, soft, nonplastic Fine-med sand, trace coarse sand, trace gravel, trace asphalt & wood pieces. (SP)	50% recovery
	2–4		20, 33, 50/5	no recovery	no recovery
	4–6		20, 40, 45, 50/4	10yr 5/3 dry, loose, nonplastic 45% fine-coarse sand, 45% angular gravel, 10% silt. (SW)	80% recovery
	6–8		52, 53, 36, 48	10yr 5/3 dry, loose, nonplastic 45% fine-coarse sand, 45% angular gravel, 10% silt. (SW)	50% recovery
	8–10		30, 48, 53, 51	10yr ~~5/3~~ 6/4 dry, loose, nonplastic 45% fine-coarse sand, 45% angular gravel, 10% silt (SW)	100% recovery
	10–12		40, 23, 17, 23	10yr 6/4 dry, loose, nonplastic ~~gl 45%~~ 50% fine-coarse sand 50% gravel (angular) (SW)	75% recovery
	12–14		20, 24, 20, 21	10yr 6/3 moist, loose, nonplastic 50% fine-coarse sand 50% gravel (SW)	50% recovery
	14–16		9, 10, 9, 8	upper .5' saturated, loose nonplastic 50% fine-coarse sand, 50% angular gravel. lower 1.1' 2.5y 5/2 silty clay (40%-50% silt) saturated, firm, high plast. (CL-CH)	80% recovery
	18				
	20				
	22				
	24				

COMMENTS:
- Boring terminated at 16'
- All Hnu and Rad readings at background levels.
- Bottom of fill encountered at 2-4'.

WESTON

4B

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-8
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-30-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 16 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		3, 4, 17, 13	upper .5' 10yr 2/1 soft, nonplastic, dry loamy (SM-PT) topsoil, grass roots. lower .7' 10yr 6/2 soft, nonplastic, dry (SW) 25% fine sand, 25% med sand, 25% coarse sand, 25% gravel.	POSSIBLE FILL; 60% recovery; ~~Recovery 1.2'~~
	2–4		8, 6, 6, 6	7.5y 5/2 soft, dry, nonplastic (ML) SILT, 10% fine-coarse sand, trace organics. (previous topsoil)	50% recovery
	4–6		19, 27, 40, 41	10yr 6/3 soft, dry, nonplastic medium sand, 10% fine sand, 10% coarse sand, 10% subang-ang gravel. (SW)	60% RECOVERY
	6–8		17, 50, 50/2	10yr 6/3 soft, dry, nonplastic medium sand, 10% fine sand, 10% coarse sand, 15% subang-ang gravel (SW)	65% recovery
	8–10		29, 50/3	10yr 6/3 soft, dry, nonplastic medium sand, 10% fine sand, 10% coarse sand, 10% subang-ang gravel. (SW)	40% recovery
	10–12		47, 63, 84	10yr 6/3 soft, moist, nonplastic 50% gravel, 35% fine sand, 10% coarse sand, 5% medium sand. Gravel is rounded. (GP)	70% recovery
	12–14		35, 56, 27, 26	upper .9': same as above. lower .3': 2.5yr 4/4 moist, firm, highly plastic clay with 40% silt (CL-CH)	60% recovery
	14–16		9, 16, 18, 13	2.5yr 4/4 saturated, firm, highly plastic SILT and CLAY (50% each) (CL-CH)	50% recovery
	16–24				

COMMENTS: Boring terminated @ 16'
All HNU & RAD readings @ background levels
Bottom of fill at 2.0'.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-9
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-30-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 8 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		34, 27, 31	upper .5' 2.5YR 5/4 loose, dry, non plastic (SP) Fine sand, trace silt and coarse sand. Lower .5' 10YR 2/2 loose, dry, nonplastic (ML) Silt, 25% fine sand, trace coarse sand	50% recovery
	2		9, 12, 14, 15	no recovery	no recovery
	4		4, 1, 2, 1	no recovery, some in sampler tip	no recovery
	6		2, 2, 1, 3	no recovery	no recovery
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS:
- Boring terminated at 8' due to presence of steam tunnel beneath hole.
- FILL DEPTH UNCERTAIN
- Hnu & RAD readings at background levels.

WESTON

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ROY F. WESTON, INC. CLIENT: ARmy MATERIAL TECHNOLOGY LABORATORY LOCATION: WATERTOWN, MA WORK ORDER NUMBER: 2281-11-01	WELL LOG WELL NUMBER: GRSB-10 PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC. DRILLING DATES: October 30, 1991 INSPECTOR: Richard Eichhorn BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE WELL DEPTH: NA FT. BELOW TOP OF PVC CASING ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL GROUNDWATER ELEVATION: NA FT. AMSL	DRILLING EQUIPMENT	
	DRILL RIG	DAVEY KENT
	SAMPLER	1 3/8" SPLIT SPOON
	HAMMER WEIGHT	140 lb
	LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		16 16 17	~~upper 5' of~~ 10yr 6/1-6-2 to 10yr 5/4 loose, dry, nonplastic Fine SAND, 10% COARSE SAND, trace subangular gravel (SP)	50% recovery
	2		14 11 14 30	10yr 6/4 loose, dry, nonplastic Fine sand, trace med & coarse sand. Coarse sand % increases to ~15% in lower 6" (SP)	50% recovery
	4		14 48 32 17	10yr 5/4 ~~fine~~ soft, dry, nonplastic Fine to coarse sand, 10% subangular gravel (SP)	65% recovery
	6		21 17 32 33	2.5YR 5/4 soft, dry, nonplastic Fine to coarse sand, 10% subangular gravel Mostly medium sand (SP)	50% recovery
	8		11 14 18 22	upper .9' 2.5y 5/4 moist-dry, loose, non plastic, fine to coarse sand, trace gravel. (SW) lower .1' 2.5y 6/4 moist-dry, loose, non plastic FINE SAND (SP)	90% recovery
	10		22 31 28 29	upper .3' 2.5y 6/4 loose, dry, nonplastic well sorted fine sand (SP) lower .7' ~~firm~~ 2.5y 4/4 firm, dry, nonplastic Fine-coarse sand, 10% subang. gravel. (SW)	50% recovery
	12		28 25 31 33	2.5y 4/4 Firm, dry, nonplastic Fine-coarse sand. 10% subang gravel (SW)	50% recovery
	14		15 15 14 17	10yR 5/4 DAMP, loose, nonplastic WELL SORTED FINE SAND (SP)	75% recovery
	16		17 16 18 19	upper .4' same as above lower 1': 10yR 5/4, soft, dry, nonplastic Fine-coarse sand, 15% med-coarse subang gravel. (SW)	70% recovery
	18		14 14 13 12	10 yR 4/4 soft, dry, nonplastic Fine-coarse sand, 15% med-coarse gravel. (SW)	60% recovery
	20		W.O.R. 8 31 38	10yR 4/4 soft, damp, nonplastic Fine-coarse sand, 15% med-coarse gravel (SW)	50% recovery
	22		33 36 31 36	10yr 4/4 soft, damp, nonplastic Fine-coarse sand, 15% med-coarse gravel (SW)	40% recovery
	24				

COMMENTS:

WESTON

ROY F. WESTON, INC.

CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY

LOCATION: WATERTOWN, MA

WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: GRSB-10

PAGE 2 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC

DRILLING DATES: October 30, 1991

INSPECTOR: Richard Eichman

BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE

WELL DEPTH: NA FT. BELOW TOP OF PVC CASING

ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL

GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24		22, 26, 30, 30	, SOFT, moist, non plastic 10yr4/4 FINE - COARSE SAND, 40% gravel, 10% SILT (SW-SM)	
	26		36, 32, 40, 32	10yr 4/4 soft, moist, non plastic Fine - coarse sand, 40% gravel, 10% silt (SW-SM)	50% recovery
	28		28, 16, 13, 12	10yr 4/4 soft, moist, non plastic Fine - coarse sand, 40% gravel, 10% silt. (stone in sampler tip) (SW-SM)	30% recovery
	30		22, 20, 17, 16	10yr 4/4 soft, moist, non plastic Fine - coarse sand, 40% gravel, 10% silt (SW-SM)	50% recovery
	32		22, 9, 13, 12	10yr 5/4 WET, SOFT, SLIGHTLY PLASTIC FINE SAND and SILT (50% EACH), TRACE COARSE SAND. (SM)	75% recovery
	34		8, 8, 6, 8	10yr 5/4 SATURATED, SOFT, SLIGHTLY PLASTIC FINE SAND, 25% MED SAND, 65% SILT	50% recovery
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: Boring TERMINATED at 36'
NO FILL ENCOUNTERED
ALL HNU & RAD readings AT BACKground LEVELS.

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WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY	WELL NUMBER: GRSB-11
LOCATION: WATERTOWN, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

	DRILLING EQUIPMENT	
DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.	DRILL RIG	DAVEY KENT
DRILLING DATES: 10-24-91	SAMPLER	1 3/8" SPLIT SPOON
INSPECTOR: Richard Eichhorn	HAMMER WEIGHT	140 lb
BOREHOLE DEPTH: 8 FT. BELOW GROUND SURFACE	LENGTH OF FALL	30"
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING		
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL		
GROUNDWATER ELEVATION: NA FT. AMSL		

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		50/5	10yr 3/1 moist, soft, low plasticity Clayey Silt (5% clay), 25% organics. (ML) Evidence of cobbles @ .5-2'	20% recovery
	2–4		14, 16, 20, 14	10yr 5/4 poorly sorted sand, 20% silt, 10% gravel. Dry, nonplastic, loose (SW-SM) ~~Evidence of cobbles @ 3'~~	25% recovery
	4–6		8, 18, 8, 4	10yr 5/4 WET, loose, nonplastic poorly sorted sand, 20% silt, 10% gravel (SW-SM)	15% recovery
	6–8		5, 3, 3, 6	10yr 5/4 SATURATED, loose nonplastic poorly sorted sand, 20% silt, 10% gravel (SW-SM)	45% recovery
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring Terminated @ 8'
Bottom of fill encountered at 6'
All Hnu and Rad readings at background levels.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-12
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-28-91
INSPECTOR: STEVE LANCAR
BOREHOLE DEPTH: 8 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		2, 3, 4, 4	10YR 3/3 SOFT, Dry, Low-med plasticity Fine-medium SAND and SILT, 10% subangular gravel, (Topsoil) organics (SM)	75% recovery
	2–4		7, 5, 7, 10	10YR 6/3 Firm, moist, high plasticity Fine SAND, SILT, and CLAY. mottling present at 3-Feet. (ML-CL)	100% recovery
	4–6		4, 7, 8, 8	10YR 5/3 STIFF, SATURATED, High PLASTICITY FINE SAND, SILT, and CLAY (ML-CL)	100% recovery
	6–8		10, 11, 13, 13	10YR 5/3 STIFF, SATURATED, HIGH PLASTICITY FINE SAND, SILT, and CLAY (ML-CL)	100% recovery
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring TERMINATED at 8'
ALL HNU / RAD readings at background levels
NO FILL DEFINED

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-13
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-31-91
INSPECTOR: TIM WARR
BOREHOLE DEPTH: 24 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		15, 22, 32, 25	10YR 6/6 SOFT, DRY, NONPLASTIC Fine SAND, 10% SILT, 10% M-C SAND, 10% subang gravel, trace organics. 10% coal and brick fragments (SP-SM)	HNU = 0.2 units; 65% recovery
	2–4		8, 10, 11, 23	Brick and mortar pieces (FILL)	HNU = 0.2 units; 85% recovery
	4–6		40, 27, 22, 27	10YR 5/4 SOFT, DRY, NONPLASTIC Fine-COARSE SAND, 10% subangular gravel, 10% silt. (SW)	35% recovery
	6–8		40, 50/2	10YR 6/4 SOFT, DRY, NONPLASTIC. FINE-COARSE SAND, 20% subangular gravel, 10% SILT. (SW)	35% recovery
	8–10		36, 37, 42, 32	upper 1': 10YR 3/2 SOFT, DRY, NONPLASTIC (SP) Fine SAND, 10% brick frags, 10% organics. (Buried topsoil?) Lower 1': 10YR 5/4, Fine-COARSE SAND, 15% subang gravel, 10% SILT, DRY, SOFT, NONPL.	HNU = 1.0 unit; 60% recovery
	10–12		9, 17, 23, 47	10YR 5/4 SOFT, DRY, NONPLASTIC. FINE-COARSE SAND, 10% subang. gravel, 5% silt. (SW)	60% recovery
	12–14		65, 27, 26, 26	10YR 5/4 SOFT, DRY, NONPLASTIC. Fine to COARSE SAND, 10% subang. gravel, 5% silt. (SW)	HNU = 4.0 units; 70% recovery
	14–16		26, 24, 31, 19	10YR 5/4 DRY, SOFT, NONPLASTIC Fine to MED SAND, 10% COARSE SAND, 5% SILT (SP)	30% recovery
	16–18		13, 13, 14, 14	10YR 6/4 MOIST, SOFT, NONPLASTIC Fine SAND, 10% MED SAND, trace COARSE SAND, trace SILT. (SP)	70% recovery
	18–20		18, 21, 17, 26	10YR 6/4 MOIST, SOFT, NONPLASTIC Fine SAND, 5% MED SAND, 5% SILT HEAVY IRON STAINING in oil at bottom of sample. (SP)	HNU = 6.0 units; 60% recovery
	20–22		23, 20, 27, 19	10YR 3/2 SOFT, NONPLASTIC, OIL SATURATED Fine SAND, 10% SILT, 5% MED SAND. Top 0.5' of sample not oil saturated (SP)	HNU = 24 units; 100% recovery
	22–24		26, 30, 18, 21	10YR 3/3 SOFT, NONPLASTIC, OIL SATURATED Fine SAND, 10% SILT, 5% MED SAND. Not as stained as 20-22' sample.	HNU = 21 units; 100% recovery

COMMENTS: Boring terminated at 24'
ALL RAD readings at background levels
Approximate FILL DEPTH = 9 Feet.

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-15
PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-1-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 24.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT
DRILL RIG: DAVEY KENT
SAMPLER: 1 3/8" SPLIT SPOON
HAMMER WEIGHT: 140 lb
LENGTH OF FALL: 30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		2, 13, 23, 19	upper .5': loamy topsoil, grass; lower 1': 10yr 2/2, dry, nonplastic, loose fine to coarse sand, 10% subang gravel, 10% silt (SW)	75% recovery
	2–4		10, 22, 32, 50/.	10yr 6/4 loose, dry, nonplastic fine to coarse sand, 15% subang gravel, trace silt (SW)	50% recovery
	4–6		34, 50, 50/3	10yr 6/4 loose, dry, nonplastic fine to coarse sand, 15% subang gravel, trace silt (SW)	40% recovery
	6–8		48, 50/4	10yr 5/6 loose, dry, nonplastic fine to coarse sand, 15% subang gravel, trace silt (SW)	50% recovery
	8–10		15, 50/3	10yr 5/4 dry, soft, nonplastic fine and medium sand, 10% coarse sand, 10% subang/ang gravel (SW)	45% recovery
	10–12		32, 26, 36, 17	10yr 5/4 dry, soft, nonplastic fine and medium sand, 10% coarse sand, 10% subang/ang gravel (SW)	80% recovery
	12–14		15, 13, 11, 17	upper 1': same as above; lower .3' 10yr 6/2 damp, soft, nonplastic fine sand, 20% med sand (SP)	65% recovery
	14–16		15, 15, 27, 15	10yR 6/3 soft, damp, nonplastic. Fine and med. sand, 10% subangular gravels. A layer of lt gray, fine sand & silt, .1 ft thick occurs in sample (SP)	HNU = 5.5 units; 80% recovery
	16–18		21, 19, 19, 13	10yr 6/4 soft, damp, nonplastic fine and medium sand, trace subangular gravel. (SP)	HNU = 0.7 units; 50% 35% recovery
	18–20		13, 14, 23, 20	10yR 6/3 soft, damp, nonplastic upper 1': 25% med sand, 10% coarse sand; lower 1': fine sand, trace med & coarse sand, tr. subang gravel (SP)	100% recovery
	20–22		12, 19, 47, 41	upper .3': same as lower 1' of above; middle 1': same as upper 1' of above; lower .3': 10yr 6/2, dry, soft, non plastic fine sand, 10% med sand, 10% coarse sand, 10% subang gravel (SP)	80% recovery
	22–24		32, 33, 24, 40	10yR 6/3 soft, dry, non plastic fine sand, trace med & coarse sand, trace gravel. Lower .3' moist. (SP)	50% recovery

COMMENTS:

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: SB-15
PAGE 2 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 1-1-91
INSPECTOR: Richard Eichelman
BOREHOLE DEPTH: 34.0 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24–26		20, 22, 15, 20	10yr 5/2 SOFT, moist, non PLASTIC Fine to coarse sand, 15% subang gravel. orange staining in gravel areas. (SW)	50% recovery
	26–28		20, 24, 18, 20	10yr 5/2 soft, moist, non plastic Fine to coarse sand, 15% subang gravel. orange staining in gravel areas. (SW)	50% recovery
	28–30		20, 27, 45, 49	10yr 5/2 soft, moist, nonplastic (SW) (SP) Fine to coarse sand, 15% subang gravel. orange staining in gravel areas.	65% recovery
	30–32			No sample, spoon broken	no sample
	32–34		8, 10, 14, 13	2.5y-5/4 SATURATED, soft, non plastic (SP) FINE SAND, trace medium / coarse sand (<10% total).	50% recovery
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: Boring terminated at 34'
No Fill encountered
ALL RAD READINGS @ background levels.

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG GRSB-17
WELL NUMBER: RFW-__
PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-6-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 32 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0		1, 2, 5, 12	upper .5': 10YR 3/2 SILTY LOAM, GRASS ROOTS. LOWER .5': 10YR 3/4 DRY, LOOSE-SOFT, NON PLASTIC SAND, 20% SILT, 10% FINE ANGULAR GRAVEL. (SW-SM)	50% RECOVERY
	2		10, 30, 32, 42	10YR/4/6 SOFT, DRY, NONPLASTIC FINE AND MEDIUM SAND, 10% COARSE SAND, 15% SUBANGULAR GRAVEL. ~~(GW)~~ SW	50% RECOVERY
	4		6, 24, 33, 38	10YR 4/6 SOFT, DRY, NONPLASTIC FINE AND MEDIUM SAND, 10% COARSE SAND, 15% GRAVEL. ~~(GW)~~ SW	55% RECOVERY
	6		48, 42, 50/4	10YR 6/4 DRY, SOFT, NONPLASTIC FINE AND MEDIUM SAND, 10% COARSE SAND, 15% GRAVEL. ~~(GW)~~ SW	50% RECOVERY
	8		28, 34, 18, 44	10YR 6/4 SOFT, DRY, NONPLASTIC FINE AND MEDIUM SAND, 10% COARSE SAND, 15% GRAVEL. ~~(GW)~~ SW	65% RECOVERY
	10		21, 17, 18, 26	10YR 5/6 DAMP, SOFT, NONPLASTIC FINE AND MEDIUM SAND, 10% COARSE SAND, 15% GRAVEL. ~~(GW)~~ SW	65% RECOVERY
	12		27, 16, 21, 23	10YR 5/4 DAMP, SOFT, NONPLASTIC FINE AND MEDIUM SAND, TRACE COARSE SAND, TRACE SUBANGULAR FINE GRAVEL. (SP)	50% RECOVERY
	14		24, 17, 16, 21	NO RECOVERY - STONE IN TIP OF SAMPLER	NO RECOVERY
	16		10, 20, 38, 36	10YR 5/4 DAMP, SOFT, NONPLASTIC FINE AND MEDIUM SAND, TRACE COARSE SAND, TRACE SUBANGULAR FINE GRAVEL. (SP)	60% RECOVERY
	18		33, 26, 50, 44	10YR 5/4 DAMP, SOFT, NONPLASTIC FINE AND MED. SAND, TRACE COARSE SAND, TRACE SUBANGULAR FINE GRAVEL. .4' THICK FINE SAND LAYER @ 19 FT. (SP)	90% RECOVERY
	20		21, 13, 14, 15	2.5Y 5/4 DAMP, SOFT, NONPLASTIC VERY FINE SAND, THIN (1mm) CROSS-BEDS. (SP)	70% RECOVERY
	22		20, 23, 25, 30	2.5Y 5/4 DAMP, FIRM, NON PLASTIC VERY FINE SAND, THIN (1mm) CROSS BEDS (SP)	50% RECOVERY
	24				

COMMENTS:

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSO-17
PAGE 2 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-6-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 32 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24		PUSHED by augers	2.5y 5/4 Damp, firm, non plastic (SP) very fine sand, thin (1mm) cross beds.	
	26				60% recovery
			21, 13, 16, 19	2.5y 5/4 WET, FIRM, MODERATE PLASTICITY (CL) Clay with 40% SILT. .2' interbeds of clay w/ 25% silt & 25% sand (fine) @ top & bottom of sample.	
	28				70% recovery
			24, 36, 25, 24	upper .8': 2.5y 5/4 SATURATED, FIRM, MOD. PLASTIC (CL) CLAY with 40% SILT. Lower 1'; 10yr 4/6 WET, SOFT, nonplastic med (SW) SAND w/ 20% fine sand, 10% coarse sand.	5% subang. gravel.
	30				90% recovery
			7, 14, 18, 24	2.5y 4/4 SATURATED, SOFT, non plastic (SP) fine and med. sand, trace subang. gravel.	
	32				60% recovery
	34				
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: BORING TERMINATED at 32'.
ALL HNU and RAD readings were at background levels.

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WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-19
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-25-91
INSPECTOR: Richard Eichhorn
BOREHOLE DEPTH: 11 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		2, 6, 9, 11	10yr 2/2 - 4/2 loose, dry, nonplastic SILT and fine SAND, 10% med-coarse sand, ~~soft~~ 5yr ... trace gravel, trace organics. (ML)	40% recovery
	2–4		11, 10, 8, 50/3	upper .3' SAME AS ABOVE; lower .9' 10YR 5/3 dry, loose, nonplastic SILT, 15% poorly sorted fine to coarse SAND, middle 3" w/ 20% coal (ML)	60% recovery
	4–6		31, 40, 18, 10	upper .7' same as lower .9' of above; lower .7' 10yr 6/2 - 7/1 loose, dry, non-plastic poorly sorted sand and subangular gravel (SW)	70% recovery
	6–8		12, 12, 5, 7	10yr 2/1 moist, firm, med plasticity SILT and CLAY, trace organics (CL-OH)	Hnu = 29 [illegible] unit; 35% recovery
	8–10		8, 4, 5, 10	10yr 2/1 WET, FIRM, HIGH PLASTICITY CLAY, 30% SILT (CH)	70% recovery

COMMENTS: Boring terminated at 11'
Bottom of fill encountered at 5'
ALL RAD readings at background levels.

WESTON

LD

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-21
PAGE 1 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 11-6-91 through 11-7-91
INSPECTOR: RICHARD EICHHORN
BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		3, 4, 4, 6	10YR 3/4 DAMP, SOFT, NONPLASTIC SILTY LOAM, TRACE FINE SAND. ~~(SP-OL)~~ (OL-SP)	65% RECOVERY
	2–4		5, 9, 20, 28	UPPER .5': 7.5Y 4/6 DRY, NONPLASTIC, SOFT SILTY LOAM, TRACE FINE SAND. (OL-SP) LOWER .4': 10YR 6/3 FINE AND MEDIUM SAND, 10% COARSE SAND, 20% SUBANG-ANG GRAVEL (SW)	45% RECOVERY
	4–6		29, 34, 30, 34	10YR 6/3 FINE AND MEDIUM SAND, 10% COARSE SAND, 20% SUBANG-ANG GRAVEL DRY, NONPLASTIC, SOFT (SW)	60% RECOVERY
	6–8		50/3	NO RECOVERY, SPLIT SPOON REFUSAL	NO RECOVERY
	8–10		35, 45, 50/2	10YR 6/3 FINE AND MEDIUM SAND, 10% COARSE SAND, 20% SUBANG-ANGULAR GRAVEL DRY, NONPLASTIC, SOFT (SW)	50% RECOVERY
	10–12		22, 47, 47, 38	10YR 6/4 DRY, SOFT, NONPLASTIC MEDIUM SAND, 10% COARSE SAND, 10% SUBANG-ANG GRAVEL (SP)	50% RECOVERY
	12–14		24, 38, 34, 33	10YR 6/4 DRY, SOFT, NONPLASTIC MEDIUM SAND, 10% COARSE SAND, 10% SUBANG-ANG GRAVEL (SP)	50% RECOVERY
	14–16		18, 21, 19, 16	UPPER 1.2': 10YR 6/3 DRY, LOOSE, NONPLASTIC MED. & FINE SAND, 20% COARSE SAND, 20% SUBANG-ANG GRAVEL. (SW) SHARP BREAK LOWER .2': 10YR 7/2 DRY, LOOSE, NONPLASTIC FINE SAND (SP)	70% RECOVERY
	16–18		14, 28, 47, 19	10YR 7/2 - 10YR 6/2 SOFT/LOOSE, DRY, NONPLASTIC INTERBEDDED FINE SAND AND FINE-MED SAND, TRACE COARSE SAND & SUBANG GRAVEL. BEDS .2 - .6' THICK. (SP)	55% RECOVERY
	18–20		24, 34, 33, 23	10YR 5/6 - 10YR 6/4 DRY, SOFT, NONPLASTIC. INTERBEDDED FINE SAND AND FINE-MED SAND, TRACE COARSE SAND & SUBANG GRAVEL. BEDS .2 - .6' THICK. (SP)	75% RECOVERY
	20–22		13, 14, 16, 19	10YR 7/2 ~~FINE DAMP, SOFT~~ LOOSE, DRY, NONPLASTIC FINE SAND, TRACE ROUNDED GRAVEL, .2' THICK INTERBEDS OF VERY FINE SAND. (SP)	75% RECOVERY
	22–24		34, 22, 16, 23	10YR 7/2 DAMP, SOFT, NONPLASTIC FINE SAND, TRACE ROUNDED GRAVELS, THIN (1mm) ~~thick~~ BEDS OF VERY FINE SAND. (SP)	75% RECOVERY
	24–26				

COMMENTS:

WESTON

ROY F. WESTON, INC.

CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY

LOCATION: WATERTOWN, MA

WORK ORDER NUMBER: 2281-11-01

WELL LOG

WELL NUMBER: GRSB-21

PAGE 2 OF 2

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.

DRILLING DATES:

INSPECTOR:

BOREHOLE DEPTH: 26 FT. BELOW GROUND SURFACE

WELL DEPTH: NA FT. BELOW TOP OF PVC CASING

ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL

GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	24		PUSHED WITH AUGER	10yr 7/2 SATURATED, SOFT, NONPLASTIC. Fine sand, trace rounded gravel, thin (1mm) beds of very fine sand. (SP)	
	26				85% recovery
	28				
	30				
	32				
	34				
	36				
	38				
	40				
	42				
	44				
	46				
	48				

COMMENTS: BORING TERMINATED @ 26'.
ALL HNU & RAD readings at background levels.

WESTON

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ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-22
PAGE / OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-28-91
INSPECTOR: STEVE LAWLOR
BOREHOLE DEPTH: 7 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		5, 7, 7, 5	10YR 5/3 SOFT, DRY, LOW PLASTICITY SILT AND FINE SAND (topsoil) (SM)	70% recovery
	2–4		4, 4, 3, 8	NO RECOVERY	NO RECOVERY
	4–6		2, 1, 1	5YR 3/2 FIRM, SATURATED, HIGH PLASTICITY SILT and CLAY (SAMPLE INTERVAL @ 4-7', sample collected @ 4'.	100% recovery
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated @ 7'
ALL HNU and RAD readings at background levels
NO FILL DEFINED

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WESTON

ROY F. WESTON, INC.	WELL LOG
CLIENT: Army Material Technology Laboratory	WELL NUMBER: GRSB-23
LOCATION: Watertown, MA	PAGE 1 OF 1
WORK ORDER NUMBER: 2281-11-01	

	DRILLING EQUIPMENT	
DRILLING CONTRACTOR: R & R International, Inc.	DRILL RIG	Davey Kent
DRILLING DATES: 10/25/91	SAMPLER	3/8" Split Spoon
INSPECTOR: Richard Eichhorn	HAMMER WEIGHT	140 lb
BOREHOLE DEPTH: 6' FT. BELOW GROUND SURFACE	LENGTH OF FALL	30"
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING		
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL		
GROUNDWATER ELEVATION: NA FT. AMSL		

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0–2		6, 11, 9, 6	upper .4' loamy topsoil, grass roots. (SM-PT) lower .35' 10YR 3/3 Dry, nonplastic, loose SILT, 20% poorly sorted sand, trace gravel, 10% wood fragments. (ML)	40% recovery
	2–4		6, 14, 12, 9	10yr 2/1 Dry, nonplastic, loose SILT, 30% fine-coarse sand, trace subang. gravel. METAL Artifact in sample (ML)	25% recovery
	4–6		10, 8, 8, 7	10YR 2/1 WET, nonplastic, loose fine-med sand, trace coarse sand and subang. gravel, wood fragments (SM)	60% recovery
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated @ 6'
Bottom of Fill not encountered
All HNu & RAD readings at background levels.

WESTON

ROY F. WESTON, INC.
CLIENT: ARMY MATERIAL TECHNOLOGY LABORATORY
LOCATION: WATERTOWN, MA
WORK ORDER NUMBER: 2281-11-01

WELL LOG
WELL NUMBER: GRSB-24
PAGE 1 OF 1

DRILLING CONTRACTOR: R & R INTERNATIONAL, INC.
DRILLING DATES: 10-28-91
INSPECTOR: STEVE LAWLER
BOREHOLE DEPTH: 14 FT. BELOW GROUND SURFACE
WELL DEPTH: NA FT. BELOW TOP OF PVC CASING
ELEVATION OF TOP OF PVC WELL CASING: NA FT. AMSL
GROUNDWATER ELEVATION: NA FT. AMSL

DRILLING EQUIPMENT	
DRILL RIG	DAVEY KENT
SAMPLER	1 3/8" SPLIT SPOON
HAMMER WEIGHT	140 lb
LENGTH OF FALL	30"

WELL CONSTRUCTION	DEPTH (FEET)	SAMPLE NUMBER	BLOWS PER 6 INCHES	CLASSIFICATION	NOTES
NO WELL INSTALLED	0			0-1.5' no sample, drilled through .7' asphalt & .9' granite slab	
	2		21, 20, 17, 46	10YR 4/2 Firm, moist, low plasticity Fine-med SAND and SILT, 10% angular gravel. (fill) (SM)	80% recovery
	4		65, 31/.2, 50/.2	10YR 5/2 Loose, dry, non-low plasticity, fine sand (possible fill) (SP)	50% recovery
	6		44, 31, 12, 18	upper .5' 10YR 5/2 Loose, moist, nonplastic fine sand, trace med sand (SP) lower .5' 10YR 5/6 Loose, moist, low plasticity Fine-coarse sand and silt (SM)	55% recovery
	8		6, 1, 2, 2	upper 1': 10YR 5/6 SOFT, moist, low plastic. fine-coarse sand and silt (SM) lower 1': 10YR 3/3 Firm, moist, high plastic. SILT w/ organics. (PEAT) (PT)	70% recovery
	10		1, 1, 1, 1	10YR 3/3 Firm, moist-saturated, high plasticity SILT w/ high organic content. Sample becomes saturated at 11.5'. (PT)	70% recovery
	12		1, 1, 2, 1	10YR 3/3 Firm, saturated, high plastic. SILT w/ high organic content (PT)	100% recovery
	14				
	16				
	18				
	20				
	22				
	24				

COMMENTS: Boring terminated at 14'
All HNU & RAD readings at background levels.
Fill encountered to approx. 4-6 feet.

(1)

CHEMICAL USAGE OF METALLURGY LAB IN BUILDING 39 OF MTL. PAGE 1

CHEMICAL NAME CHEMICAL NAME	USER'S NAME USER'S NAME	STORED AT STORED AT	CHARACTERISTICS OF CHEMICAL CHARACTERISTICS OF CHEMICAL	Quantity Used Quantity Used
1-Butanol	M.Pepi X5145	B39 R159		30 oz/yr
Acetic Acid	M.Pepi X5145	B39 R159	Corrosive	12 L/yr
Acetone	M.Pepi X5145	B39 R159		------
Ammonium Bifluoride	M.Pepi X5145	B39 R147		1 oz/yr
Ammonium Hydroxide	M.Pepi X5145	B39 R147	Corrosive	7 L/yr
Ammonium Molybdate	M.Pepi X5145	B39 R147		3 oz/yr
Ammonium Persulfate	M.Pepi X5145	B39 R147		1 Kg/yr
Benzalkonium Chloride 50%Solution	M.Pepi X5145	B39 R159		50 ml/yr
Boric Acid	M.Pepi X5145	B39 R147		5 oz/yr
Calcium Chloride	M.Pepi X5145	B39 R147		-----
Carbon	M.Pepi X5145	B39 R147		
Castor Oil	M.Pepi X5145	B39 R159		------
Chromium Metal	M.Pepi X5145	B39 R147		
Chromium Trioxide	M.Pepi X5145	B39 R147		1 Kg/yr
Citric Acid	M.Pepi X5145	B39 R147		10 oz/yr
Cobalt Metal	M.Pepi X5145	B39 R147		
Copper Metal	M.Pepi X5145	B39 R147		
Cupric Ammonium Chloride	M.Pepi X5145	B39 R147		50 g/yr
Cupric Chloride	M.Pepi X5145	B39 R147		100 g/yr
Cupric Sulfate	M.Pepi X5145	B39 R147		50 g/yr
DisodiumEthylenediamineTetraacetate	M.Pepi X5145	B39 R147		100 g/yr
Ethanol	M.Pepi X5145	B39 R159		40 Gal/yr
EthyleneDiamineTetraAcetateChloride	M.Pepi X5145	B39 R147		
EthyleneGlycolMonobutylEther	M.Pepi X5145	B39 R159		100 oz/yr
Ferric Chloride	M.Pepi X5145	B39 R147		100 g/yr
Glass cleaner	M.Pepi X5145	B39 R159		2 oz/yr
Glycerin	M.Pepi X5145	B39 R159		300 ml/yr
Hydrochloric Acid	M.Pepi X5145	B39 R159	Corrosive;violent Rx w/many chemicals;Rx w/H2O>toxic fumes.	12 L/yr
Hydrofluoric Acid	M.Pepi X5145	B39 R159	Corrosive;skin & eye irritant;Rx w/H2O>toxic fumes.	1 L/yr
Hydrogen Peroxide	M.Pepi X5145	B39 R159		2 L/yr
Instrument Oil	M.Pepi X5145	B39 R159		1 oz/yr
Iron Boron	M.Pepi X5145	B39 R147		
Iron Metal	M.Pepi X5145	B39 R147		
Isocut Oil	M.Pepi X5145	B39 R159		1 Qt/yr
Kerosene	M.Pepi X5145	B39 R159		2 Gal/yr
Kodak Dektol Developer	M.Pepi X5145	B39 R142		4000 oz/yr
Kodak D-19 Developer	M.Pepi X5145	B39 R142		2000 oz/yr
Kodak Photo Resist	M.Pepi X5145	B39 R142		-----
Kodak Photo-Phlo	M.Pepi X5145	B39 R142		12 oz/yr
Kodak Rapid Fixer	M.Pepi X5145	B39 R142		20 Gal/yr
Kodak Stop Bath	M.Pepi X5145	B39 R142		300 oz/yr
Lactic Acid	M.Pepi X5145	B39 R159		200 ml/yr
Lead Shot	M.Pepi X5145	B39 R147		
Lithium Hydroxide	M.Pepi X5145	B39 R147	Corrosive	
Lithium under Kerosene	M.Pepi X5145	B39 R147		0 g/yr
Malic Acid	M.Pepi X5145	B39 R147		3 oz/yr
Menthol	M.Pepi X5145	B39 R147		
Metal Cutting Fluid	M.Pepi X5145	B39 R159		
Methanol	M.Pepi X5145	B39 R159		4 L/yr
Molybdic Acid	M.Pepi X5145	B39 R147		3 oz/yr
Nickel Metal	M.Pepi X5145	B39 R147		
Nitric Acid	M.Pepi X5145	B39 R159		7 L/yr
Monacidic Oil	M.Pepi X5145	B39 R159		-----

L. Chemical Inventory
for MTL

CHEMICAL USAGE OF METALLURGY LAB IN BUILDING 39 OF NTL.

CHEMICAL NAME	USER'S NAME	STORED AT	CHARACTERISTICS OF CHEMICAL	Quantity Used
Oxalic Acid	M.Pepi X5145	B39 R147		2 lb/yr
Pakosol	M.Pepi X5145	B39 R159		2 Qt/yr
Palladium	M.Pepi X5145	B39 R147		
Paraffin Oil	M.Pepi X5145	B39 R159		10 oz/yr
Perma Wash	M.Pepi X5145	B39 R142		3 Qt/yr
Permcunt	M.Pepi X5145	B39 R159		0 Qt/yr
Phosphoric Acid	M.Pepi X5145	B39 R159		1 L/yr
Potassium Bichromate	M.Pepi X5145	B39 R147		30 g/yr
Potassium Bisulfite	M.Pepi X5145	B39 R147		100 g/yr
Potassium Bromide	M.Pepi X5145	B39 R147		0 g/yr
Potassium Dichromate	M.Pepi X5145	B39 R147		30 g/yr
Potassium Ferricyanide	M.Pepi X5145	B39 R147		200 g/yr
Potassium hydroxide	M.Pepi X5145	B39 R147	Corrosive	100 g/yr
Potassium Permanganate	M.Pepi X5145	B39 R147		
Potassium Pyrosulfate	M.Pepi X5145	B39 R147		0 g/yr
Propanol	M.Pepi X5145	B39 R159		0 L/yr
Pump Oil	M.Pepi X5145	B39 R159		----
Silica Gel	M.Pepi X5145	B39 R147		
Silicon Mold Release	M.Pepi X5145	B39 R147		12 oz/yr
Silicon Monoxide	M.Pepi X5145	B39 R147		
Silver Nitrate	M.Pepi X5145	B39 R147		0.5 g/yr
Sodium Bisulfite	M.Pepi X5145	B39 R147		15 oz/yr
Sodium Carbonate	M.Pepi X5145	B39 R147		8 oz/yr
Sodium hydroxide	M.Pepi X5145	B39 R147	Corrosive;skin & eye irritant;Rx w/many chemicals.	5 lb/yr
Sodium Metal Bisulfate	M.Pepi X5145	B39 R147		100 g/yr
Sodium Molybdate	M.Pepi X5145	B39 R		8 oz/yr
Sodium Nitrate	M.Pepi X5145	B39 R147		10 g/yr
Sodium Sulfate	M.Pepi X5145	B39 R147		50 g/yr
Sodium Sulfite	M.Pepi X5145	B39 R147		10 Kg/yr
Sodium Theosulfate	M.Pepi X5145	B39 R147		10 g/yr
Sodium Thiosulfate	M.Pepi X5145	B39 R147		15 oz/yr
Stannous Chloride	M.Pepi X5145	B39 R147		50 g/yr
Sulfuric Acid	M.Pepi X5145	B39 R159	Corrosive;acidic oxidizer,ignite or explode w/many materials	100 ml/yr
Tannic Acid	M.Pepi X5145	B39 R147		3 oz/yr
Tartaric acid	M.Pepi X5145	B39 R147		10 oz/yr
Tin Metal	M.Pepi X5145	B39 R147		
TridecylbenzeneSodiumSulfinate	M.Pepi X5145	B39 R147		
Xylenes	M.Pepi X5145	B39 R142		1 Qt/yr
Xylol-Xylene	M.Pepi X5145	B39 R159		10 oz/yr
Zinc Metal	M.Pepi X5145	B39 R147		

CHEMICAL INVENTORY OF MATERIALS TECHNOLOGY LABORATORY PAGE 1

CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	QUANTITY USED
CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	QUANTITY USED
Cutting fluid	Azrin X5310	Bldg 39 Room		6 Gal/yr
Epoxy Resin	Azrin X5310	Bldg 39 Room		1 Pt/yr
Ethanol	Azrin X5310	Bldg 39 Room		1 Qt/yr
Lubricating oil	Azrin X5310	Bldg 39 Room		1 Pt/yr
Methanol	Azrin X5310	Bldg 39 Room		1 Gal/yr
Pentane	Azrin X5310	Bldg 39 Room	Highly flammable	1 Pt/yr
Quench oil	Azrin X5310	Bldg 39 Room		100 Gal/yr
Vacuum oil	Azrin X5310	Bldg 39 Room		1 Gal/yr
Acetone	Bulpett X5649	Bldg 39 Room	Flammable	5 Gal/yr
Chloroform	Bulpett X5649	Bldg 39 Room		2 Gal/yr
Ethyl Acetate	Bulpett X5649	Bldg 39 Room		1/4 Gal/yr
Methanol	Bulpett X5649	Bldg 39 Room	flammable	2 Gal/yr
Toluene	Bulpett X5649	Bldg 39 Room		1 Gal/yr
Trichloroethylene	Bulpett X5649	Bldg 39 Room		1/4 Gal/yr
2,4-TDI	Byrne X5122	Bldg 39 Room 5--		1 Gal/yr
Acetonitrile	Byrne X5122	Bldg 39 Room 5--	Flammable;Rx w/water/acids>toxic fumes	10 Gal/yr
BD	Byrne X5122	Bldg 39 Room 5--		2 Gal/yr
Calcium chloride CaCl2	Byrne X5122	Bldg 39 Room5--	Violent Rx w/BrF3;incomp w/Zn,H20	3 lbs/yr
CHDI	Byrne X5122	Bldg 39 Room 5--		2 lbs/yr
Desmodur N-75	Byrne X5122	Bldg 39 Room 5--		1/2 Gal/yr
Desmophen 650A-65	Byrne X5122	Bldg 39 Room 5--		1 Gal/yr
Dibutyltinlaurate (T-12 catalyst)	Byrne X5122	Bldg 39 Room 5--		10 gm/yr
Dichlormethane	Byrne X5122	Bldg 39 Room 5--		1 Gal/yr
Dimethylsulfoxide DMSO CAS 67-68-5	Byrne X5122	Bldg 39 Room 5--		1 pt/yr
Jeffamine D-2000	Byrne X5122	Bldg 39 Room 5--		5 Gal/yr
Magnesium Sulfate MgSO4	Byrne X5122	Bldg 39 Room		2 lbs/yr
MDI	Byrne X5122	Bldg 39 Room 5--		1 lb/yr
MDI H12	Byrne X5122	Bldg 39 Room 5--		1 Qt/yr
Mercury (Hg)	Byrne X5122	Bldg 39 Room5--	Violent Rx w/NH3 and other chemicals	None
Methanol	Byrne X5122	Bldg 39 room 5--	Flammable	5 Gal/yr
Methylisobutylketone CAS 108-10-1	Byrne X5122	Bldg 39 Room 5--		1 pt/yr
Multron R-221-75	Byrne X5122	Bldg 39 Room 5--		1 Gal/yr
Polacure 740M	Byrne X5122	Bldg 39 Room 5--		1 lb/yr
Polyethylene imine	Byrne X5122	Bldg 39 Room 5--		100 gm/yr
Polyethyleneglycol	Byrne X5122	Bldg 39 Room 5--		1 Gal/yr
Polytetramethafineoxide PTMO	Byrne X5122	Bldg 39 Room 5--		3 Gal/yr
Sodium Bicarbonate Na2CO3	Byrne X5122	Bldg 39 Room5--		2 lbs/yr
Sodium Carbonate NaHCO3	Byrne X5122	Bldg 39 Room5--		5 lbs/yr
Sodium chloride NaCl	Byrne X5122	Bldg 39 Room5--		5 lbs/yr
Sodium Chromate Na2Cr207	Byrne X5122	Bldg 39 Room 5--	Caustic;powerful oxidizer	2 lbs/yr
TDI diisocyanate	Byrne X5122	Bldg 39 Room 5--		1 lb/yr
Tetrahydrofuran	Byrne X5122	Bldg 39 Room 5--	Flammable;Rx w/oxidizers;violent w/air	50 Gal/yr
Trimethylolpropane	Byrne X5122	Bldg 39 Room 5--		1/2 lb/yr
Acetone	Granville X5172	Bldg 311 Comp		300 Gal/yr
Aliphatic Curing agents	Granville X5172	Bldg 311 Comp		10 Gal/yr
Amine Curing agents	Granville X5172	Bldg 311 Comp		200 Gal/yr
Aramid Fibers	Granville X5172	Bldg 311 Comp		200 lbs/yr
Carbon/Graphite Fibers	Granville x5172	Bldg 311 Comp		200 lbs/yr
Dichloroethane	Granville X5172	Bldg 311 Comp		55 Gal/yr
Epoxy resins	Granville X5172	Bldg 311 Comp		450 Gal/yr
Epoxy Structural Film Adhesives	Granville X5172			100 lbs/yr
Glass Fibers	Granville X5172	Bldg 311 Comp		500 lbs/yr
Glass/Epoxy Prepregs	Granville X5172	Bldg 311 Comp		100 lbs/yr
Graphite/Epoxy Prepregs	granville X5172	Bldg 311 Comp		150 lbs/yr

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CHEMICAL INVENTORY OF MATERIALS TECHNOLOGY LABORATORY PAGE 2

CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	QUANTITY USED
Kevlar/Epoxy Prepregs	Granvil.e X5172	Bldg 311 Comp		50 lbs/yr
Nylon Bleeder Cloth	Granvil.e X5172	Bldg 311 Comp		200 lbs/yr
Nylon resin	Granvil.e X5172	Bldg 311 Comp		150 lbs/yr
Polycarbonate Resin	Granvil.e X5172	Bldg 311 Comp		500 lb/yr
Polyester resin	Granvil.e X5172	Bldg 311 Comp		55 Gal/yr
Polyethylene Fibers	Granvil.e X5172	Bldg 311 Comp		100 lbs/yr
Polyethylene Resin	Granvil.e X5172	Bldg 311 Comp		300 lbs/yr
Polyethylene/Polypropylene film	Granvil.e X5172	Bldg 311 Comp		150 lbs/yr
Polyphenylene Sulfide resin	Granvil e X5172	Bldg 311 Comp		100 lbs/yr
Polypropylene Resin	Granville X5172	Bldg 311 Comp		200 lbs/yr
Polysulfone Resin	Granville X5172	Bldg 311 Comp		300 lbs/yr
Polyterephtholate Resin	Granville X5172	Bldg 311 Comp		100 lbs/yr
Polyurethane Elastomer resin	Granville X5172	Bldg 311 Comp		1000 lbs/yr
Polyurethane;Polyol & Isocyanate	Granville X5172	Bldg 311 Comp		55 Gal/yr
Polyvinyl Alcohol Film	Granville X5172	Bldg 311 Comp		200 lbs/yr
Polyvinyl Fluoride Film	Granville X5172	Bldg 311 Comp		100 lbs/yr
Polyvinyl-dene Fluoride Resin	Granville X5172	Bldg 39 Comp		150 lbs/yr
N-butanol CAS 71-36-3	Macaione X5147	Bldg 39 Room	Flammable;Rx w/oxidizers	5 Gal/yr
O-Dichlorobenzene CAS 95-50-1	Macaione X5147	Bldg 39 Room	Eye,skin irritant;Rx w/oxidizers	200 cc/yr
Phenol CAS 108-95-2	Macaione X5147	Bldg 39 Room	Mod toxic by skin contact;heat toxicfume	4 lbs/yr
P-Bromophenol CAS 106-41-2	Macaione X5147	Bldg 39 Room		5 lbs/yr
P-Chlorophenol CAS 106-48-9	Macaione X5147	Bldg 39 Room		5 lbs/yr
Acetone	Pott; X5053	Bldg 39 Room	Flammable	1/2 Gal/yr
N-Methylpyrrolidone	Pott; X5053	Bldg 39 Room		1/2 Gal/yr
Tetrahydrofuran	Pott;X5053	Bldg 39 Room	Flammable;Rx w/oxidizers,violent w/air	1 Gal/yr
Toluene	Pott;X5053	Bldg39Room		2 Gal/yr
Methylene chloride	Sloa; X5649	Bldg 39 Room		5 Gal/yr
Tetrahydrofuraan	Sloa; X5649	Bldg 39 Room	Flammable;Rxs w/oxidizers;stnd w/air vio	5 Gal/yr
Freon liquid	Wells X 5327	Bldg 39 Room 156		1 Gal/yr
Molybdic Anhydride	Wells X 5327	Bldg 39 Room		
Sodium Chromate	Wells X 5327	Bldg 39 Room 155		100 gm/yr
1,1 Dichloroethane	Wells X5327	Bldg 39 Room		
1.1.1.Trichloroethane	Wells X5327	Bldg 39 Room		
2-Propanol	Wells X5327	Bldg 39 Room	Flammable	
Acetic Acid (Glacial)	Wells X5327	Bldg 39	Corrosive	
Acetone CAS 67-64-1	Wells X5327	Bldg 39 Room 156	Flammable;Rx w/oxidizers	2 Gal/yr
Aluminum Chloride	Wells X5327	Bldg 39 Room		
Ammonium Nitrite	Wells X5327	Bldg 39 Room		
Anhydrone	Wells X5327	Bldg 39 Room 156	Dessicant	100 gm/yr
Bromine	Wells X5327	Bldg39 Room 155		100 ml/yr
Bromine 5% in Methanol	Wells X5327	Bldg 39 Room		
Chromium trioxide CAS 1333-82-0	Wells X5327	Bldg 39 Room 155	Oxidizer;incomp w/ acetone,alcohols	100 gm/yr
Cupric Sulfate	Wells X5327	Bldg 39 Room		
Ethyl Acetate	Wells X5327	Bldg 39 Room		
Freon Liquid (C2Cl2F2)	Wells X5327	Bldg 39 Room		
Glycerin	Wells X5327	Bldg 39 Room		
HgX for Mercury spills	Wells X5327	Bldg 39 Room		
Iso-amyl acetate	Wells X5327	Bldg 39 Room		
Iso-amyl alcohol	Wells X5327	Bldg 39 Room	Flammable	
Kerosene	Wells X5327	Bldg 39 Room		
Methanol CAS 67-56-1	Wells X5327	Bldg 39 Room 156	Flammable;Rxs w/oxidizers	3 Gal/yr
Nickelous Sulfate	Wells X5327	Bldg 39 Room		
Nickel(ous) Chloride	Wells X5327	Bldg 39 Room		
Nitric acid	Wells X5327	Bldg39Hallwayopp153	Corrosive & Oxidizer;Rx w/H2O>toxic fume	1 Gal/yr
Perchloric Acid 10% in Methanol	Wells X5327	Bldg 39		

CHEMICAL INVENTORY OF MATERIALS TECHNOLOGY LABORATORY PAGE 3

CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	QUANTITY USED
Perchloric Acid,CAS 7601-90-3	Wells X5327	Bldg 39 Room 155	Oxidizer;Anhydrous form:can explode	100 ml/yr
Phosphorus Pentoxide CAS 1314-56-3	Wells X5327	Bldg 39 Room 155	Corrosive;incomp w/H2O,HF,metals & other	100 gm/yr
Silicon oil	Wells X5327	Bldg 39 Room		
Sodium Hydroxide	Wells X5327	Bldg 39 Room	Corrosive	
Sodium lauryl sulphate	Wells X5327	Bldg39 Room 155		100 gm/yr
Sodium Thiosulphate	Wells X5327	Bldg 39 Room 155		100 gm/yr
Sulphuric Acid	Wells X5327	Bldg39HallwayoppR153	Corrosive;oxidizer;ignite or expl w/many	1 Gal/yr
Turbine engine oil MIL-L-23699	Wells X5327	Bldg 39 Room		50 Gal/yr
Uranyl Nitrate	Wells X5327	Bldg 39 Room		
Zinc Chloride	Wells X5327	Bldg 39 Room		
Ethanol	Wells X5337	Bldg 39 Room 156	Flammable	10 Gal/yr
Dichloropentane	McHugh X5503	Bldg 39 Room5--		3 Gal/yr
Acetone	McHugh X5503	Bldg 39 room 5--	Flammable;Rx w/oxidizers	6 Gal/yr
Methyl alcohol CAS 67-56-1	McHugh X5503	Bldg 39 room 5--	Flammable;Rx w/oxidizers	3 Gal/yr
Diisopropylmethylphosphonate	McHugh X5503	Bldg 39 Room 5--		3 Gal/yr
Isopropyl alcohol CAS 67-63-0	McHugh X5503	Bldg 39 Room 5--	Eye irritant;mod. explosion hazardw/heat	2 Gal/yr
Cyclohexane	McHugh X5503	Bldg 39 Room 5--		3 Gal/yr
Hexane	McHugh X5503	Bldg 39 Room 5--		5 Gal/yr
Xylene	McHugh X5503	Bldg 39 Room 5--		1 Gal/yr
Sodium Hydroxide	McHugh X5503	Bldg 39 Room 5--	Corrosive	2lbs/yr
Diethyl triamine	McHugh X5503	Bldg 39 Room 5--		3 Gal/yr
Toluene CAS 108-88-3	McHugh X5503	Bldg 39 Room 5--	Flammable;mod. toxic via inhalation	3 Gal/yr
Methyl Cellusolve	McHugh X5503	Bldg 39 Room 5--		2 Gal/yr
N-methyl formamide	McHugh X5503	Bldg 39 Room 5--		0.1 Qt/yr
Chlorethylethylsulfide	McHugh X5503	Bldg 39 Room 5--		
Diisopropylfluorophosphonate	McHugh X5503	Bldg 39 Room 5--		
Dibutylphthalate	McHugh X5503	Bldg 39 Room 5--		2 Gal/yr
Dimethylmethylphosphonate	McHugh X5503	Bldg 39 Room 5--		1 Qt/yr
Trichlorethylene	McHugh X5503	Bldg 39 Room 5--		1 Qt/yr
Triacetylmethylammonium chloride	McHugh X5503	Bldg 39 Room 5--		1 Qt/yr
Tetrabutylammonium hydroxide	McHugh X5503	Bldg 39 Room 5--		1 Qt/yr

Alphabetically Sortec Chemical Inventory of File CHINV415. Page 1

CHEMICAL NAME	USER'S NAME	STORED AT	CHARACTERISTICS OF CHEMICAL	Quantity Used
Benzene	Caslavsky	X5127B312 R199	Flammable;human carcinogen;reacts w/oxidizing materials	8 L/yr
Ether	Caslavsky	X5127B312 R199	Flammable	8 L/yr
Hydrochloric Acid	Caslavsky	X5127B312 R199	Corrosive	2 L/yr
Neodymium Oxide	Caslavsky	X5127Bldg312Room199		0.25 Kg/yr
Nickel	Caslavsky	X5127Bldg312Room199		0.5 Kg/yyr
Nitric acid	Caslavsky	X5127B312 R199	Corrosive	3 L/yr
Sulphuric Acid	Caslavsky	X5127B312 R199	Corrosive	1 L/yr
Alumina 2,4-Pentaridonate	Ceramics	Bldg313		0.5 Kg/yr
Aluminum Secbutoxide	Ceramics	Bldg313		2 Kg/yr
Anhydrous Isopropanol	Ceramics	Bldg313	Flammable	40 L/yr
Arsenic Oxide	Ceramics	Bldg313		1 Kg/yr
Barium Hydroxide Monohydrate	Ceramics	Bldg313		0.25 Kg/yyr
Barium Nitrate	Ceramics	Bldg313		2 Kg/yr
Barium Oxide	Ceramics	Bldg313		0.2 Kg/yr
Barium Titenate	Ceramics	Bldg312		1 Kg/yr
Butanol	Ceramics	Bldg313	Flammable	18 L/yr
Cadmium Oxide	Ceramics	Bldg313		0.5 Kg/yr
Cerium Sulfate	Ceramics	Bldg313		0.5 Kg/yr
Chromium	Ceramics	Bldg313		0.5 Kg/yr
Chromium Trioxide	Ceramics	Bldg313		0.5 Kg/yr
Colloidal Cerium Acetate	Ceramics	Bldg313		1 Kg/yr
Colloidal Cerium Nitrate	Ceramics	Bldg313		1 L/yr
Colloidal Zirconium Acetate	Ceramics	Bldg313		4 L/yr
Copper Fluoride	Ceramics	Bldg313		0.02 Kg/yr
Copper Oxide	Ceramics	Bldg313		0.0003Kg/yr
Epoxy Binder	Ceramics	Bldg313S		8 L/yr
Hexamethylene Tetramine	Ceramics	Bldg313		0.5 Kg/yr
Hydrogen Peroxide	Ceramics	Bldg313		1 L/yr
Iron 2-Ethylhexanoate	Ceramics	Bldg313		0.25 Kg/yr
Lanthanum Chloride	Ceramics	Bldg313		0.1 Kg/yr
Lanthanum Oxide	Ceramics	Bldg313		0.5 Kg/yr
Lithium Acetate	Ceramics	Bldg313		1 Kg/yr
Lithium Fluoride	Ceramics	Bldg313		0.5 Kg/yr
Lithiumaluminosilicate	Ceramics	Bldg313		2.3 Kg/yr
Magnesium Acetate	Ceramics	Bldg313		1 Kg/yr
Magnesium Ethoxide	Ceramics	Bldg313		0.5 Kg/yr
Methoxyethanol	Ceramics	Bldg313	Flammable	15 Kg/yr
Molybdenum Oxide	Ceramics	Bldg313		0.6 Kg/yr
Nickel 2-Ethylhexanoate	Ceramics	Bldg313		0.25 Kg/yr
Nickel Oxice	Ceramics	Bldg313		2.5 Kg/yr
Potassium Hydroxide	Ceramics	Bldg313		1 Kg/yr
Silicon Dioxide	Ceramics	Bldg313		95 Kg/yr
Sodium Hexameta Phosphate	Ceramics	Bldg313		1 Kg/yr
Sodiumcarboxymethocellulose	Ceramics	Bldg313		0.5 Kg/yr
Strontium Chloride	Ceramics	Bldg313		0.1 Kg/yr
Strontium Nitrate	Ceramics	Bldg313		1.5 Kg/yr
Strontium Oxide	Ceramics	Bldg313		1 Kg/yr
Strontium Titanate	Ceramics	Bldg313		1 Kg/yr
Tertbutyl Alcohol	Ceramics	Bldg313	Flammable	2 L/yr
Titanium Isopropoxide	Ceramics	Bldg313		1 Kg/yr
Tungsten Oxide	Ceramics	Bldg313		0.1 Kg/yr
Urea	Ceramics	Bldg313		0.5 Kg/yr
Vanadium Oxide	Ceramics	Bldg313		0.6 Kg/yr
Yttrium Nitrate	Ceramics	Bldg313		1 Kg/yr

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Zinc Oxide	Ceramics	Bldg313		1 Kg/yr
Zirconium N-Propoxide	Ceramics	Bldg313		0.5 Kg/yr
Yttrium Acetate	CeramicsX5415	Bldg313Cer		1 Kg/yr
Aluminum Nitride	G. Gilde X5169	33-3S Hot Press		11.5 Kg/yr
Silicon Carbide	G. Gilde X5169	33-3S Hot Press		1 Kg/yr
Darvan 821A	G.Gilde X5169	33-3S Hot Press		1 L/yr
Darvan C	G.Gilde X5169	33-3S Hot Press		1 L/yr
Ethanol	G.Gilde X5169	33-3S Hot Press	Flammable	48 L/yr
Glycerol	G.Gilde X5169	33-3S Hot Press		1 L/yr
Isopropanol	G.Gilde X5169	B313S Hot Press	Flammable	8 L/yr
Methocel Binder	G.Gilde X5169	B313S Hot Press		1 Kg/yr
Molybdenum Disilicide	G.Gilde X5169	B313S Hot Press		0.05 Kg/yr
Oleic Acid	G.Gilde X5169	B313S Hot Press		1.5 L/yr
Oxalic Acid	G.Gilde X5169	B313S Hot Press		0.5 Kg/yr
Polyvinyl Alcohol (PVA)	G.Gilde X5169	B313S Hot Press	Flammable	1 Kg/yr
Stearic Acid	G.Gilde X5169	B313S Hot Press		1 Kg/yr
Tungsten Carbide	G.Gilde X5169	B313S Hot Press		1 Kg/yr
XUS Experimental Ceramic Binder	G.Gilde X5169	B313S Hot Press		1 Kg/yr
Cerium Nitrate	L.Shutt X5169	B313S Slip Cast		0.7 Kg/yr
Colloidal Alumina	L.Shutt X5169	B313S Slip Cast		4 L/yr
Colloidal Yttria	L.Shutt X5169	B313S Slip Cast		5 L/yr
Colloidal Zirconium Nitrate	L.Shutt X5169	B313S Slip Cast		4 L/yr
Flexible Collodion	L.Shutt X5169	B313S Slip Cast		1 L/yr
Lanthanum Nitrate	L.Shutt X5169	B313S Slip Cast		1 Kg/yr
Titanium Diboride	L.Shutt X5169	B313S Slip Cast		56 Kg/yr
Titanium Nitride	L.Shutt X5169	B313S Slip Cast		10.5 Kg/yr
Toluene	L.Shutt X5169	B313S Slip Cast	Flammable;mod. toxic by inhalation	8 L/yr
Acetone	Ron Rich X5457	B3 13N R227	Flammable	16 L/yr
Aluminum Oxide	Ron Rich X5457	B3 13N R227		50 Kg/yr
Aluminum Powder	Ron Rich X5457	B3 13N R227		1 Kg/yr
Barium Carbonate	Ron Rich X5457	B3 13N R227		1 Kg/yr
Boric Oxide	Ron Rich X5457	B3 13N R227		45.5 Kg/yr
Boron Nitride	Ron Rich X5457	B3 13N R227		5.5 Kg/yr
Calcium Oxide	Ron Rich X5457	B3 13N R227		3.5 Kg/yr
Indium Oxide	Ron Rich X5457	B3 13N R227		0.01 Kg/yr
Iron	Ron Rich X5457	B3 13N R227		0.5 Kg/yr
Iron Oxide	Ron Rich X5457	B3 13N R227		5 Kg/yr
Lithium Carbonate	Ron Rich X5457	B3 13N R227		0.5 Kg/yr
Magnesium Oxide	Ron Rich X5457	B3 13N R227		8 Kg/yr
Magnesium Powder	Ron Rich X5457	B3 13N R227	Flammable	71 Kg/yr
Methanol	Ron Rich X5457	B3 13N R227	Flammable	16 L/yr
Phosphoric Acid	Ron Rich X5457	B3 13N R227	Corrosive	1 L/yr
Phosphorus Pentoxide	Ron Rich X5457	B3 13N R227		0.5 Kg/yr
Silicon	Ron Rich X5457	B3 13N R227		1.4 Kg/yr
Silicon Nitride	Ron Rich X5457	B3 13N R227		14.5 Kg/yr
Sodium Carbonate	Ron Rich X5457	B3 13N R227		1.4 Kg/yr
Tin Oxide	Ron Rich X5457	B3 13N R227		0.6 Kg/yr
Trichlorethylene	Ron Rich X5457	B3 13N R227		4 L/yr
Vacuum pump Oil	Ron Rich X5457	B3 13N R227		20 L/yr
Yttrium Oxide	Ron Rich X5457	B3 13N R227		5 Kg/yr
Zirconium Oxide	Ron Rich X5457	B3 13N R227		3 Kg/yr
Aluminum Nitrate	R.Lancto X5177	B3 13S R194		1.5 Kg/yr
Ammonium Polyacrylate	R.Lancto X5177	B3 13S R194		1.5 L/yr
Anhydrous Ethanol	R.Lancto X5177	B3 13S R194	Flammable	10 L/yr
Colloidal Silica	R.Lancto X5177	B3 13S R194		3 L/yr
Dow Antifoam	R.Lancto X5177	B3 13S R194		1.4 Kg/yr

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Hydroxypropylcellulose	R.Lancto X5177 B313S R194		).02 Kg/yr
Lignosil	R.Lancto X5177 B313S R194		).04 Kg/yr
Polyethylene Glycol (PEG)	R.Lancto X5177 B313S R194		2.2 L/yr
Polyvinylbuteral	R.Lancto X5177 B313N R194		0.2 L/yr
Tetraethyltitanate	R.Lancto X5177 B313S R194		2 Kg/yr
Tetraisopropyltitarate	R.Lancto X5177 B313S R194		1 Kg/yr
Titanium	R.Lancto X5177 B313S R194		0.5 Kg/yr
Titanium Chloride	R.Lancto X5177 B313S R194		2 Kg/yr
Titanium Oxide	R.Lancto X5177 B313S R194		1.1 Kg/yr
Ammonium Hydroxide	R.Lancto X5177 B313S R194	Corrosive	6 L/yr
Metal Alkoxides	Spurgeon X5365 Bldg313		8 L/yr
Metal Chelates	Spurgeon X5365 B312 R199A		8 L/yr
Paint Bases	Spurgeon X5365 Bldg313		8 L/yr
Paint Thinners	Spurgeon X5365 Bldg313		8 L/yr
Polyester Binder	Spurgeon X5365 Bldg312 R199A		8 L/yr
Polyurethane Binder	Spurgeon X5365 B312 R199A		8 L/yr
Tetraethoxysilane	Spurgeon X5365 B313 R199	Flammable	5 Kg/yr
Tetramethoxysilane	Spurgeon X5365 Bldg312 R199	Flammable	2 Kg/yr

CHEMICAL INVENTORY OF CORROSION BRANCH IN BUILDING 39 OF MTL.

CHEMICAL NAME	USER'S NAME	STORED AT	CHARACTERISTICS OF CHEMICAL	Quantity Used
Sodium Chloride	BuckleyX5342	Bldg39Room202	Violent Rx W/BrF3;Li.A skin & severe eye irritant	300 lbs/yr
Sodium Fluoride	BuckleyX5342	Bldg39Room202	Poison to humans by ingestion;Eye irritant.	100 lbs/yr
Potassium Fluoride	BuckleyX5432	Bldg39Room202	Corrosive;Very reactive and irritating material	100 lbs/yr
Lithium Chloride	BuckleyX5432	Bldg39Room202	Violent Rx w/BrF3;heated to decomp. emits toxic Cl fumes.	10 lbs/yr
Potassium Chloride	BuckleyX5432	Bldg39Room202	Chlorides when heated to decomp. emit toxic Cl fumes.	10 lbs/yr
Magnesium Fluoride	BuckleyX5432	Bldg39Room202		50 lbs/yr
Socium Hydroxide	BuckleyX5432	Bldg39Room202	Corrosive;skin & eye irritant;reacts w/many chemicals.	10 lbs/yr
Socium Carbonate	BuckleyX5432	Bldg39Room202		10 lbs/yr
Calcium hypochlorite;calcium oxide	BuckleyX5432	Bldg39Room202	CaO is a caustic;Cahypochlorite danger above212F;Rx w/water.	5 lbs/yr
Sulfuric Acid (Conc.)	BuckleyX5432	Bldg39Room202	Corrosive;acidic oxidizer,ignite or explode w/many materials	20 L/yr
Hycrochloric Acid(Conc.)	BuckleyX5432	Bldg39Room202	Corrosive;violent Rx w/many chemicals;Rx w/water>toxic fumes	20 L/yr
Nitric Acid	BuckleyX5432	Bldg39Room202	Corrosive & Oxidizer;Rx w/water>prod. toxic fumes and heat.	10 L/yr
Hycrofluoric Acid (Conc.)	BuckleyX5432	Bldg39Room202	Corrosive;skin,eye irritant;Rx w/water>toxic fumes.	2 L/yr
Ethanol	BuckleyX5432	Bldg39Room202	Flammable	10 L/yr
Acetone	BuckleyX5432	Bldg39Room202	Flammable	10 L/yr
DS-2 (70 wt% diethylenetriamine 28 wt% ethylene glycol monomethyl ether,2 wt% sodium hydroxide	BuckleyX5432	Bldg39Room202		2 L/yr
Amronium Hydroxice	BuckleyX5432	Bldg39Room202	Corrosive	5 L/yr
Sodium Nitrite	BuckleyX5432	Bldg39Room202	Oxidizer;flammable;w/organic matter will ignite by friction.	1 Kg/yr
Sodium Molybdote	BuckleyX5432	Bldg39Room202		1 Kg/yr
Sodium Nitrate	BuckleyX5432	Bldg39Room202	Oxidizer;explodes heated over 1000 F or mixed w/cyanides!	0.5 Kg/yr
Sodium Sulfate	BuckleyX5432	Bldg39Room202	Violent Rx w/Al;heated to decomposition emits toxic fumes.	1 Kg/yr
Cerium Chloride	BuckleyX5432	Bldg39Room202		0.1 Kg/yr
Lanthanum Chloride	BuckleyX5432	Bldg39Room202		0.1 Kg/yr
Sodium Chromate	BuckleyX5432	Bldg39Room202		1 Kg/yr
Sodium Dichromate	BuckleyX5432	Bldg39Room202		1 Kg/yyr
Benzotriazole	BuckleyX5432	Bldg39Room202		0.1 Kg/yr
Benzothiazole	BuckleyX5432	Bldg39Room202		0.1 Kg/yr
Sulfanilimide	BuckleyX5432	Bldg39Room202		0.05 Kg/yr
Beuzonitrile	BuckleyX5432	Bldg39Room202		0.1 Kg/yr
N-Lauroyl SarcosineONa salt)	BuckleyX5432	Bldg39Room202		0.05 Kg/yr
Benzimidizol	BuckleyX5432	Bldg39Room202		0.05 Kg/yr
I-phenyl-z-thiourea	BuckleyX5432	Bldg39Room202		0.05 Kg/yr
Aluminum	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Stainless Steel	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Nickel Aluminide	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Aluminum Ploypster	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Aluminum Oxide	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Chromium Oxide	HyleX5199	B39PlasmaSprayRoom		1 lb/yr
Cobalt based NiCr	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Chromium Carbide	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
White alumina	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Ytt-ia stabizirconia	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Ni-Al cermet	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Ni-Co/Cr/Al/Y	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Polyester	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Aluminum-polyester	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Tri-glycedial Isocyanurate	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Mat-seal SA(SIAL)	huleX5199	B39PlasmaSprayRoom		1 lb/yr
Mab-seal AP (phenolic)	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Epoxy Resin Sealer	HuleX5199	B39PlasmaSprayRoom		1 lb/yr
Epoxy polyamid primer	HuleX5199	B39PlasmaSprayRoom		1 lbs/yr
Polyurethane topcoat(Carc)	HuleX5199	B39PlasmaSprayRoom		1 lbs/yr 1 lb/yr

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CHEMICAL NAME	R.SinglerX5120 STORED AT	CHARACTERISTICS OF CHEMICAL	Quantity Used
Acetic Acid	R.SinglerX5120 Bldg 39 Room	Corrosive	3 Gal/year
Acetone CAS 67-64-1	R.SinglerX5120 Bldg 39 Room	Flammable;reacts w/oxidizers	80 Gal/year
Acetonitrile CAS 75-05-8	R.SinglerX5120 Bldg 39 Room	Will react w/water,steam,acids > toxic & flammable fumes	2 Gal/year
Ammonium Hydroxide	R.SinglerX5120 Bldg 39 Room	Corrosive	2 Gal/year
Benzene CAS 71-43-2	R.SinglerX5120 Bldg 39 Room	Flammable;human carcinogen;reacts w/oxidizing materials	2 Gal/year
Calcium sulphate	R.SinglerX5120 Bldg 39 Room		1 lb/year
CH2Cl2 CAS 75-09-2	R.SinglerX5120 Bldg 39 Room		25 Gal/year
Chloroform CHCl3 CAS 67-66-3	R.SinglerX5120 Bldg 39 Room	Skin and eye irritant;Violent Rx w/many chemicals.	25 Gal/year
Cyclohexane	R.SinglerX5120 Bldg 39 Room		2 Gal/year
Ethyl Acetate CAS 141-78-6	R.SinglerX5120 Bldg 39 Room	Human systemic irritant;fire hazard w/heat or flame	5 Gal/year
Ethyl alcohol CAS 64-17-5	R.SinglerX5120 Bldg 39 Room	Flammable	55 Gal/year
Ethyl Ether CAS 60-29-7	R.SinglerX5120 Bldg 39 Room	Flammable;sev explos w/heat or flame;vig rx w/acetylperoxide	5 Gal/year
Ethylene glycol CAS 107-21-1	R.SinglerX5120 Bldg 39 Room	Toxic in particulate form on inhalation;combustible w/heat.	1 Gal/year
Hexachlorocyclotriphosphazene	R.SinglerX5120 Bldg 39 Room		2 lb/year
Hexane	R.SinglerX5120 Bldg 39 Room		5 Gal/year
Hydrochloric Acid	R.SinglerX5120 Bldg 39 Room	Corrosive	5 Gal/year
Isopropyl Alcohol CAS 67-63-0	R.SinglerX5120 Bldg 39 Room	Eye irritant;mod. explosion hazard w/heat or flame.	30 Gal/year
Methyl Alcohol CAS 67-56-1	R.SinglerX5120 Bldg 39 Room	Flammable;reacts w/oxidizers	55 Gal/year
Methylethylketone(MEK)CAS79933	R.SinglerX5120 Bldg 39 Room		2 Gal/year
Nitric Acid	R.SinglerX5120 Bldg 39 Room	Corrosive	3 Gal/year
Pentene	R.SinglerX5120 Bldg 39 Room	Highly flammable	5 Gal/year
Potassium Hydroxide	R.SinglerX5120 Bldg 39 Room	Corrosive	1 lb/year
Saturated Hydrocarbons C5-C7	R.SinglerX5120 Bldg 39 Room		30 Gal/year
Sodium dispersed in mineral oil	R.SinglerX5120 Bldg 39 Room		1 lb/year
Sodium hydride	R.SinglerX5120 Bldg 39 Room		1 lb/year
Sodium Hydroxide	R.SinglerX5120 Bldg 39 Room	Corrosive	10 lb/year
Sulfuric Acid	R.SinglerX5120 Bldg 39 Room	Corrosive	10 Gal/year
Tetrahydrofuran CAS 109-99-9	R.SinglerX5120 Bldg 39 Room	Flammable;reacts w/oxidizers, violently w/air on standing.	55 Gal/year

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CHEMICAL INVENTORY OF MTL SOLVENT SHED BUILDING 243 FEBRUARY 1992,ALPHABETICALLY SORTED BY CHEMICAL AND LOCATION PAGE 1

ITEM	CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	NUMBER OF CONTAINERS	VOLUME OF CONTAINERS
045	1,2 Dichloroethane;Fisher E 175	MTL	Bldg 243 CabF(13896)	Flammable;strong irritant	5	1 Qt
045	1,4 Dioxane;Fisher D 111	MTL	Bldg 243 CabF(13896)	Flammable;poison by inhal;Rx w/oxidizers	1	1 Qt
047	1,4 Dioxane;Fisher D 111-500	MTL	Bldg 243 CabF(13896)	Flammable;poison by inhal;Rx w/oxidizers	6	500 mls
056	1-Propanol;Fisher A 414	MTL	Bldg 243 CabF		4	1 Qt
077	Acetic Acid,Glacial;Eastman	MTL	Bldg 243 Acid Shed	Corrosive	20	5 Pt
073	Acetic Acid,Glacial;Fisher A 38	MTL	Bldg 243 Acid Shed	Corrosive	4	5 lbs
082	Acetone-Tech;Sacramento Army Depot	MTL	Solvent Shed Bldg243	Flammable;Rx w/oxidizers	5	55 Gal. drums
027	Alcohol,Reagent;Fisher A 962-4	MTL	Bldg 243 CabD(13891)		1	4 Liters
076	Ammonium hydroxide;Fisher A669-212	MTL	Bldg 243 Acid Shed	Corrosive	3	2.5 Liters
069	Ammonium hydroxide;J.T.Baker9721-01	MTL	Bldg 243 unopened cs	Corrosive	6	500 mls
051	Ammonium Hydroxide;Mallinck.3256	MTL	Bldg 243 CabF	Corrosive	3	500 mls
010	ANSUL E-141;Fisher(Ether)	MTL	Bldg 243 CabA(13895)	Flammable	1	5 Gal. can
018	Benzene;Fisher B 245	MTL	Bldg 243 CabB(13893)	Flammable;Poison;Rx w/oxidizers	1	20 Liters
016	Benzene;Fisher B 245-1	MTL	Bldg 243 CabB(13893)	Flammable;Poison;Rx w/oxidizers	1	1 Qt
017	Benzene;Fisher B 245-4	MTL	Bldg 243 CabB(13893)	Flammable;Poison;Rx w/oxidizers	4	4 Liters
019	Benzene;Mallinckrodt 3859	MTL	Bldg 243 CabB(13893)	Flammable;Poison;Rx w/oxidizers	1	1 Gal.
012	Carbon Tetrachloride;Burdick&Jack.	MTL	Bldg 243 CabB(13893)	Danger when heated;susp carc;Rx w/many	3	4 Liters
055	Chlorobenzene;Fisher B255	MTL	Bldg 243 CabF	Skin & eye irritant;w/heat>toxic fumes	2	1 Qt
020	Chloroform;Mallinckrodt,Amer.Lab,MA	MTL	Bldg 243 CabB(13893)	Poison by inhal. or ingest;Rx w/many	1	20 Liters
013	Chloroform;Optima C 297-4	MTL	Bldg 243 CabB(13893)	Poison by inhal or ingest;Rx w/many	4	4 Liters
031	Cyclohexane 205;Caledon 3201-2	MTL	Bldg 243 CabD(13891)	Flammable;skin,eye irritant;Rx w/oxidize	5	4 Liters
030	Cyclohexane;Caledon3200-2	MTL	Bldg 243 CabD(13891)	Flammable;skin,eye irritant;Rx w/oxidize	1	4 Liters
067	Cyclohexane;J.T.Baker 9296-03	MTL	Bldg 243 unopened cs	Flammable;skin,eye irritant;Rx w/oxidize	4	4 Liters
011	Cyclohexanone;Eastman	MTL	Bldg 243 CabA(13895)	Eye,skin irritant;Rx w/oxidizers;Flam.	1	5 Gal. can
070	Dichloroethane;J.T.Baker 2440-02	MTL	Bldg 243 unopened cs	Flam;strong irritant;w/heat>toxic fumes	4	4 Liters
023	Dichloromethane;Caledon 3501-2	MTL	Bldg 243 CabC(13892)	Heated to decomp>toxic fumes;skin irrit.	1	4 Liters
008	Dimethyl Sulfoxide;Crown	MTL	Solvent Shed Bldg243	Skin & eye irritant;allergen ;Rx w/many	1	55 Gal. drums
068	Dimethylformamide;J.T.Baker 9221-03	MTL	Bldg 243 unopened cs	Flammable;poison,skin contact;Rx w/many	6	500 mls
043	Dinethylsulfoxide;Caledon 4101-2	MTL	Bldg 243 CabF(13896)	Skin & eye irritant;allergen;Rx w/many	6	1 Qt
037	Dioxane;Mallinckrodt 4737	MTL	Bldg 243 CabE(13890)		2	1 Gal.
005	Ethanol	MTL	Solvent Shed Bldg243	Flammable	1	55 Gal. drums
059	Ethyl acetate;Caledon 4601-2	MTL	Bldg 243 CabF	Human system irritant;fire hazard w/heat	2	1 Qt
057	Ethyl acetate;Fisher E 145-500	MTL	Bldg 243 CabF	Human system irritant;fire hazard w/heat	12	500 mls
064	Ethyl acetate;J.T.Baker 9282-03	MTL	Bldg 243 unopened cs	Human system irritant;fire hazard w/heat	4	4 Liters
040	Ethyl ether;Mallinckrodt 0350 Red	MTL	Bldg 243 CabE(13890)	Flammable	6	2.5 Kgs
058	Ethylene bromide;Fisher [illegible] 173	MTL	Bldg 243 CabF	Attacks rubber,plastic;Decomp>toxic fume	8	500 mls
041	Ethylene glycol;MC/B 5387	MTL	Bldg 243 CabF(13896)		3	1 Kg
042	Glycerol,Biotech grade;Bio Quant	MTL	Bldg 243 CabF(13896)		11	500 mls
006	Heptane	MTL	Solvent Shed Bldg243	CNS irritant;flammable,Rx w/oxidizers	1	55 Gal. drum
009	Heptane;Caledon Labs	MTL	Bldg 243;CabA(13895)	CNS irritant;flammable;Rx w/oxidizers	21	4 Liters
029	Hexane;Caledon 5601-2	MTL	Bldg 243 CabD(13891)	Flammable;eye irritant;Rx w/oxidizers	1	4 Liters
028	Hexane;Fisher H 292-4	MTL	Bldg 243 CabD(13891)	Flammable;eye irritant;Rx w/oxidizers	2	4 Liters
072	Hydrochloric Acid;HiPure H4100	MTL	Bldg 243 Acid Shed	Corrosive	38	6 lbs
064	Hydrofluoric Acid;Fisher A 147-1	MTL	Bldg 243 CabF(13856)	Corrosive	12	1 lb.
049	Isopropyl alcohol,tech;Phippe	MTL	Bldg 243 CabF(13856)		8	
048	Isopropyl alcohol;Mallinckrodt 3035	MTL	Bldg 243 CabF(13856)		1	1 Pt
004	Isopropyl Alcohol;Quantum Chem.OH	MTL	Solvent Shed Bldg243	Eye irritant;mod.explosion hazardw/heat	3	55 Gal. drums
003	Methanol;Axton-Cross,Hol. MA	MTL	Solvent Shed Bldg243	Flammable;Rx w/oxidizers	2	55 Gal. drums
025	Methanol;Fisher A 412-4	MTL	Bldg 243 CabC(13852)	Flammable;mod explos w/flame;Rx w/oxidiz	3	4 Liters
065	Methanol;J.T.Baker 9093-03	MTL	Bldg 243 unopened cs	Flammable;Rx w/oxidizers	4	4 Liters
036	Methylene chloride;Fisher D 151-4	MTL	Bldg 243 CabE(13850)	Eye & skin irritant	4	4 Liters
060	Methylethylketone;Fisher M 209-500	MTL	Bdlg 243 CabF	Flammable;eye & skin irritant	6	500 mls
024	Methylisobutylketone;Fisher M 213	MTL	Bldg 243 CabC(13852)	Flammable;eye & nasal irritant.	2	1 Gal.
052	Methylisobutylketone;Fisher M 213	MTL	Bldg 243 CabF	Flammable;eye & nasal irritant	10	1 Qt

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CHEMICAL INVENTOFY OF MTL SOLVENT SHED BUILDING 243 FEBRUARY 1992,ALPHABETICALLY SORTED BY CHEMICAL AND LOCATION PAGE 2

ITEM	CHEMICAL NAME	USER'S NAME	LOCATION	CHARACTERISTICS OF CHEMICAL	NUMBER OF CONTAINERS	VOLUME OF CONTAINERS
053	Mineral Oil;Fisher O 120	MTL	Bldg 243 CabF		17	1 Qt
035	N,N Dimethylformamide;Fish D119-500	MTL	Bldg 243 CabD(~3891)	Flammable;poison,skin contact;Rx w/many	6	500 mls.
034	N,N Dimethylformamide;Fisher D 119	MTL	Bldg 243 CabD(~3891)	Flammable;poison,skin contact;Rx w/many	1	1 Gal.
033	N,N dimethylformamide;MC/B DX 1730	MTL	Bldg 243 CabD(~3891)	Flammable;Poison,skin contact;Rx w/many	5	3 Kgs.
014	n-pentene;Fisher P 399-4	MTL	Bldg 243 CabB(~3893)	EXPLOSION,FIRE W/HEAT;Blister on contact	4	4 Liters
026	n-Propanol;Fisher	MTL	Bldg 243 CabC(~3892)		2	20 Liters
032	Paraffin oil;Fisher O 120	MTL	Bldg 243 CabD(~3891)		1	1 Gal.
015	Pentane;Fisher O 4062-4	MTL	Bldg 243 CabB(~3893)	EXPLOSION,FIRE W/HEAT;Blister on contact	2	4 Liters
066	Pentane;J.T.Baker 9331-03	MTL	Bldg 243 unopened cs	Highly flammable;blister on contact	4	4 Liters
037	Petroleum Ether;Fisher E 139-4	MTL	Bldg 243 CabE(~3890)	Flammable	3	4 Liters
065	Petroleum ether;J.T.Baker 9268-03	MTL	Bldg 243 unopened cs	Flammable	4	4 Liters
075	Phosphoric Acid;Mallinckrodt 2796	MTL	Bldg 243 Acid Shed	Corrosive	5	500 mls
055	Pyridine;Fisher P 368	MTL	Bldg 243 CabF	Flammable;Decomp>toxic CN fumes	10	1 Qt
075	Sulfuric acid,50% Vol;Banco	MTL	Bldg 243 Acid Shed	Corrosive	3	5 Pts
073	Sulfuric Acid;Fisher A 300-212	MTL	Bldg 243 Acid Shed	Corrosive	4	2.5 Liters
064	Sulfuric Acid;J.T.Baker 9681-03	MTL	Bldg 243 unopened cs	Corrosive	6	2.5 Liters
004	Tetrahydrofuran Axton-Cross,Hol.MA	MTL	Solvent Shed Bldg243	Flammable;Rx w/oxidizers,violently w/air	2	55 Gal. drums
051	Tetrahydrofuran;Fisher T 425-4	MTL	Bldg 243 CabF(~3896)	Flammable;Rx w/oxidizers;violently w/air	1	4 Liters
062	Tetrahydrofuran;J.T.Baker 9441-03	MTL	Bldg 243 unopened cs	Flammable;Rx w/oxidizers;violently/air	4	4 Liters
022	Toluene;Caledon 2901-2	MTL	Bldg 243 CabC(~3892)	Flammable;toxic by inhal;Rx w/oxidizers	3	4 Liters
021	Toluene;Fisher T 290-4	MTL	Bldg 243 CabC(~3892)	Flammable;toxic by inhal;Rx w/oxidizers	2	4 Liters
071	Toluene;J.T.Baker	MTL	Bldg 243 unopened cs	Flammable;toxic by inhal;Rx w/oxidizers	4	4 Liters
033	Trichloroethylene;Fisher T 131-S	MTL	Bldg 243 CabE(~3890)	Poison by inhal;skin & eye irritant	3	4 Liters
007	Vacuum Pump Oil	MTL	Solvent Shed Bldg243		2	55 Gal. drums

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Hazardous Waste Disposal Record of MTL for Calendar Year 1990 in Chronological Order

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
D001	274			21-Feb-90	GSX	NC05201	UN1325;Truck# P-23;WB# 4795
D001D003	160			21-Feb-90	GSX	NC05201	UN1325
D005	95			21-Feb-90	GSX	NC05201	NA1760;ORM-B
MA99	325			21-Feb-90	GSX	NC05201	Non-regulated solids
D005D007D008	75			21-Feb-90	GSX	NC05202	NA9189;ORM-E
D001			5	21-Feb-90	GSX	NC05202	UN1993
D002			1	21-Feb-90	GSX	NC05202	UN1956
MA99	35			21-Feb-90	GSX	NC05202	Ferromanganese granules
D002			3	21-Feb-90	GSX	NC05203	UN1760
MA99	4			21-Feb-90	GSX	NC05203	Solid sulfer;non-regulated
D001	1			21-Feb-90	GSX	NC05203	UN1325
MA99	90			21-Feb-90	GSX	NC05203	Empty containers
D002			2	21-Feb-90	GSX	NC05204	UN1760
MA99	120			21-Feb-90	GSX	NC05204	Crushed glass
D002	64			21-Feb-90	GSX	NC05204	UN1760
MA99	60			21-Feb-90	GSX	NC05204	Empty containers
MA99			1	21-Feb-90	GSX	NC05205	UN2810;poison B liquid
D001		158		21-Feb-90	GSX	NC05205	UN1993
MA99	285			21-Feb-90	GSX	NC05205	Truck# P-23 WB# 4795
D001			1	21-Feb-90	GSX	NC05206	UN1954
D001			20	21-Feb-90	GSX	NC05206	UN1993
D001D007	5			21-Feb-90	GSX	NC05206	UN1479 oxidizer
MA99	160			21-Feb-90	GSX	NC05206	steel turnings;graphite
MA99	8			21-Feb-90	GSX	NC05207	UN1759;corrosive solid
D002D008	45			21-Feb-90	GSX	NC05207	Battery,wet type;UN2794
D006	110			21-Feb-90	GSX	NC05207	Poison B;UN2810
MA99			13	21-Feb-90	GSX	NC05207	Non-regulated liquid
D007	20			21-Feb-90	GSX	NC05208	UN1759;corrosive solid
F005	12			21-Feb-90	GSX	NC05208	UN1759
MA99	12			21-Feb-90	GSX	NC05208	Non-regulated solids
MA99			5	21-Feb-90	GSX	NC05208	Non-regulated liquid
D001			15	21-Feb-90	GSX	NC05209	UN2014;hydrogen peroxide
D008	185			21-Feb-90	GSX	NC05209	NA9189;ORM-B
D001D008			18	21-Feb-90	GSX	NC05209	NA1263;waste paint
MA99	200			21-Feb-90	GSX	NC05209	Non-regulated solid
D008	550			21-Feb-90	GSX	NC05210	NA9189;ORM-E
D002			50	21-Feb-90	GSX	NC05210	UN1760;corrosive liquid]
D006F008	300			21-Feb-90	GSX	NC05210	UN2810;poison B
MA99			85	21-Feb-90	GSX	NC05210	Non-regulated liquid
MA99	400			21-Feb-90	GSX	NC05211	UN1759;corrosive solid
MA99			85	21-Feb-90	GSX	NC05211	NA1270;oil;combustible liquid
MA99	250			21-Feb-90	GSX	NC05211	Non-regulated solid
MA99			275	21-Feb-90	GSX	NC05211	Non-regulated liquid
MA99	400			21-Feb-90	GSX	NC05212	UN1759;corrosive solid
MA99	230			21-Feb-90	GSX	NC05212	Non-regulated solid
MA99	200			21-Feb-90	GSX	NC05212	Non-regulated solid
MA99	800			21-Feb-90	GSX	NC05212	Non-regulated solid
MA99	200			21-Feb-90	GSX	NC05213	UN1759;corrosive solid
D002			35	21-Feb-90	GSX	NC05213	NA1719;alkaline liquids
MA99			185	21-Feb-90	GSX	NC05213	colloidal silica
MA99	250			21-Feb-90	GSX	NC05213	Ferro-phos slag
MA99	800			21-Feb-90	GSX	NC05214	Asbestos;NA9189
F005			100	21-Feb-90	GSX	NC05214	UN1993
MA99	680			21-Feb-90	GSX	NC05214	Non-regulated solid
MA99	415			21-Feb-90	GSX	NC05214	Non-regulated solids

GSX-GSX Services,Reidsville,NC; CH-BRT-Clean Harbors,Braintree,MA

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Hazardous Waste Disposal Record of MTL for Calendar Year 1990 in Chronological Order

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
MA99			20	21-Feb-90	GSX	NC05215	NA1693;ORM-A
MA99	450			21-Feb-90	GSX	NC05215	PCB ballasts
MA99	100			21-Feb-90	GSX	NC05215	UN2811;poison B
MA99			125	21-Feb-90	GSX	NC05215	glycol solutions
D001D008			27	21-Feb-90	GSX	NC05216	UN1993
D011			80	21-Feb-90	GSX	NC05216	NA9189;ORM-E
D011			40	21-Feb-90	GSX	NC05216	bleach or fixer solution
MA99	750			21-Feb-90	GSX	NC05216	Non-regulated solids
D002D007			7	21-Feb-90	GSX	NC05217	UN1760
MA99			5	21-Feb-90	GSX	NC05217	UN2810;poison B
D002			55	21-Feb-90	GSX	NC05217	NA1719;alkaline liquid
MA99	225			21-Feb-90	GSX	NC05217	Non-regulated solids
MA99			2	21-Feb-90	GSX	NC05218	UN1198;formaldehyde solution
D002D004			1	21-Feb-90	GSX	NC05218	UN1760;corrosive liquid
D002D006		6		21-Feb-90	GSX	NC05218	UN1760;corrosive liquid
D002D007			2	21-Feb-90	GSX	NC05218	UN1760
D001F0005			2	21-Feb-90	GSX	NC05219	UN1993
D001F002			1	21-Feb-90	GSX	NC05219	UN1993
MA99	160			06-Jun-90	GSX	NC01571	asbestos
MA99	270			06-Jun-90	GSX	NC01571	asbestos
P106	230			06-Jun-90	GSX	NC01571	sodium cyanide solid
P098	50			06-Jun-90	GSX	NC01571	Potassium cyanide solid
P029	100			06-Jun-90	GSX	NC01572	Copper cyanide;Truck#I-40
P030	26			06-Jun-90	GSX	NC01572	Waste cyanide;PO#11608
D002			16	06-Jun-90	GSX	NC01572	KOH,hydroquinone
F005			7	06-Jun-90	GSX	NC01572	Acetone/Methylethylketone
D002			14	06-Jun-90	GSX	NC01573	Tris-aminopropyl ether /triol
D001			1	06-Jun-90	GSX	NC01573	UN2924
MA99			7	06-Jun-90	GSX	NC01573	Detergent
MA99	115			06-Jun-90	GSX	NC01573	Non-regulated solid
D001			5	06-Jun-90	GSX	NC01574	Xylene/Isopropyl alcohol
D001	100			06-Jun-90	GSX	NC01574	Copper alloy powder
MA99	280			06-Jun-90	GSX	NC01574	Silica sand
MA99	120			06-Jun-90	GSX	NC01574	Clay
MA99	75			06-Jun-90	GSX	NC01575	NaOH;dry
D002			7	06-Jun-90	GSX	NC01575	NaOH;sodium sulfite
D004	115			06-Jun-90	GSX	NC01575	NA 9189;ORM-E
MA99	150			06-Jun-90	GSX	NC01575	Carbon pitch
D001			5	06-Jun-90	GSX	NC01576	UN1993
MA99	56			06-Jun-90	GSX	NC01576	Beryllium cmpd UN1566
U080			6	06-Jun-90	GSX	NC01576	Methylene chloride
U210	13			06-Jun-90	GSX	NC01576	Poison B solid
D001	6			06-Jun-90	GSX	NC01577	Sodium peroxide;UN1479
U151	12			06-Jun-90	GSX	NC01577	Mercury,metallic
MA99			10	06-Jun-90	GSX	NC01577	Poison B UN2810
MA99	800			06-Jun-90	GSX	NC01577	Polishing cakes
D006	1			06-Jun-90	GSX	NC01578	Dry cell battery NA1813
MA99	150			06-Jun-90	GSX	NC01578	Nickel carbonate powder UN2811
D001	1			06-Jun-90	GSX	NC01578	Organic peroxide
MA99	495			06-Jun-90	GSX	NC01578	Empty drums
P022			1	06-Jun-90	GSX	NC01579	Carbon disulfide
U075			1	06-Jun-90	GSX	NC01579	UN1956 compressed gas
D001			1	06-Jun-90	GSX	NC01579	UN1954 compressed gas
D001			1	06-Jun-90	GSX	NC01579	UN1954 flammable gas
D001			1	06-Jun-90	GSX	NC01581	UN1993 flammable liquid

GSX-GSX Services,Reidsville,NC; CH-BRT-Clean Harbors,Braintree,MA

Hazardous Waste Disposal Record of MTL for Calendar Year 1990 in Chronological Order

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
D001			1	06-Jun-90	GSX	NC01581	UN1993 flammable liquid
D001			1	06-Jun-90	GSX	NC01581	UN1993
D001			8	06-Jun-90	GSX	NC01581	UN1993
D001			7	06-Jun-90	GSX	NC01582	UN1993;4 containers
D001			2	06-Jun-90	GSX	NC01582	UN1993
D001			2	06-Jun-90	GSx	NC01582	UN1993
P015	1			06-Jun-90	GSX	NC01582	UN2811 poison B
MA99	100			05-Nov-90	GSX	MAC735553	Nickel chloride
D001			5	05-Nov-90	GSX	MAC735553	NA1263 waste paint
MA99	12			05-Nov-90	GSX	MAC735553	Hardened epoxy resins
MA99	60			05-Nov-90	GSX	MAC735553	Non-regulated lab chemicals
F002			3	05-Nov-90	GSX	MAC735554	Tetrachloroethylene/H2O
F002F003F005	22			05-Nov-90	GSX	MAC735554	Spill cleanup NA9189
F002D002			1	05-Nov-90	GSX	MAC735554	Ethanol/H2O
F003			1	05-Nov-90	GSX	MAC735554	Acetone/H2O
D001			1	05-Nov-90	GSX	MAC735555	Toluene/polyurethane
D001			3	05-Nov-90	GSX	MAC735555	Flammable lab chemicals
MA99			1	05-Nov-90	GSX	MAC735555	ORM-E NA9188
D002			1	05-Nov-90	GSX	MAC735555	Ethancl/sodium hydroxide
D001			3	05-Nov-90	GSX	MAC735555	acetone/xylene
D002			2	05-Nov-90	GSX	MAC735555	Nitric acid/hydrochloric acid
D001D002			1	05-Nov-90	GSX	MAC735555	Glacial acetic acid
D002			5	05-Nov-90	GSX	MAC735555	Sodium,potassium hydroxide
MA99			15	05-Nov-90	GSx	MAC735553	Combustible oil
D008			25	05-Nov-90	GSX	MAC735553	Ammonium thiosulfate;PbNO3
MA99	6			05-Nov-90	GSX	MAC735553	UN1956;dichlorofluoromethane
D001	27			05-Nov-90	GSX	MAC735553	Spray paint;UN1954
D001			1	05-Nov-90	GSX	MAC735559	UN1221,isopropylamine
U061	1			05-Nov-90	GSX	MAC735559	NA2761;Cl2diphenylCl3ethane
D001	1			05-Nov-90	GSX	MAC735559	Tetramethylorthosilicate
D003	1			05-Nov-90	GSX	MAC735559	Lithium metal/LiOH
D010	1			05-Nov-90	GSX	MAC735560	Selenous acid
D002			1	05-Nov-90	GSX	MAC735560	Ammonium hydroxide
MA99	8			05-Nov-90	GSX	MAC735560	UN1759
D001			30	05-Nov-90	GSX	MAC735560	Ethanol/methanol
D001			5	05-Nov-90	GSX	MAC735561	UN2924;neutralizer/nitric acid
D001			50	05-Nov-90	GSX	MAC735561	Methylene chloride/acetone
F002			1	05-Nov-90	GSx	MAC735561	Trichlorotrifluoroethane
D001			1	05-Nov-90	GSX	MAC735561	Ethanol/methanol
D002			15	05-Nov-90	GSX	MAC735563	Hydrochloric acid/water
MA99	22			05-Nov-90	GSX	MAC735563	Empty epoxy containers
D011			10	05-Nov-90	GSX	MAC735563	Acetic acid/water
MA99			5	05-Nov-90	GSX	MAC735563	Hydraulic fluid
D001			10	05-Nov-90	GSX	MAC735564	Waste paint UN1263
D001			10	05-Nov-90	GSX	MAC735564	Epoxy adhesive
MA99			550	05-Nov-90	GSX	MAC735564	Hydraulic fluid;vermiculite
D002			15	05-Nov-90	GSX	MAC735564	Waste acid
D009	3			05-Nov-90	GSX	MAC735566	Metallic mercury
MA99	30			05-Nov-90	GSX	MAC735566	PCB ballasts
MA99			11	05-Nov-90	GSX	MAC735566	Non-regulated liquid
MA99			1	05-Nov-90	GSX	MAC735566	Non-regulated solid
MA99	300			05-Nov-90	GSX	MAC735567	Asbestos
MA99	2500			05-Nov-90	GSX	MAC735567	Fiberglass/epoxy resin
MA99	7500			05-Nov-90	GSX	MAC735567	Sulfuric acid;carbon UN1759
D001D008			3	05-Nov-90	GSX	MAC735567	Waste paint NA1263

GSX-GSX Services,Reidsville,NC; CH-BRT-Clean Harbors,Braintree,MA

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Hazardous Waste Disposal Record of MTL for Calendar Year 1990 in Chronollogical Order

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
D002D007			5	05-Nov-90	GSX	MAC735568	Sulfuric acid/water
MA99			45	05-Nov-90	GSX	MAC735568	Combustible oil
MA99	7			05-Nov-90	GSX	MAC735568	Sulfamic acid
D002			10	11-Dec-90	CH-BRT	MAF296498	Diethylenetriamine UN1760

HAZARDOUS WASTE DISPOSAL RECORD BY CHRONOLOGICAL ORDER Page 1

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
MA01			110	16-May-91	CH-BRT	MAF321458	Oil/Ethylene glycol/H2O
D011			163	17-May-91	ROMAR	MAF324520	Spent photo solutions
D001	50			01-Aug-91	CH-NAT	MAF339533	Flammable compressed gas
D001D002D007			1	01-Aug-91	CH-NAT	MAF339534	Oxidizer;corrosive liquid
D001D007	40			01-Aug-91	CH-NAT	MAF339534	Oxidizers
D001D040P022		500		01-Aug-91	CH-NAT	MAF339533	
D005D006D002		90		01-Aug-91	CH-NAT	MAF339532	Corrosive liquids
D007D008	85			01-Aug-91	CH-NAT	MAF339533	Hazardous solid;Nickel
D007D008	58			01-Aug-91	CH-NAT	MAF339532	flammable solid nickel
D009		7		01-Aug-91	CH-NAT	MAF339532	Poison B liquid
MA01		40		01-Aug-91	CH-NAT	MAF339532	Waste oil
MA99	100			01-Aug-91	CH-NAT	MAF339533	Asbestos
MA01	1600			07-Aug-91	CO-GCH	MAF329274	Oily rags
MA01	12600			07-Aug-91	CO-GCH	MAF329274	Boiler soot and ash
MA01	22000			08-Aug-91	CO-GCH	MAF330126	Cutting sludge
D011			53	03-Sep-91	ROMAR	MAF328525	Corrosive photo waste
MA01			1210	07-Sep-91	CO-CYN	MAF328008	22 drums waste oil
MA01			150	09-Sep-91	CO-GCH	MAF326917	Halogenated used oils
MA01	5000			09-Sep-91	CO-GCH	MAF326917	Oily garnet
MA01			990	09-Sep-91	CO-GCH	MAF326917	Water soluble oils
F003			55	10-Sep-91	CO-LDL	MAF326918	Used oil/gasoline/ace/tol.
MA01			55	10-Sep-91	CO-CYN	MAF326873	On spec waste oil
MA98			55	10-Sep-91	CO-OLS	MAF326919	Off spec used oil
D001	15			19-Sep-91	CH-NAT	MAF340786	Flammable solid
D001	40			19-Sep-91	CH-NAT	MAF339375	Oxidizer
D001D007	15			19-Sep-91	CH-NAT	MAF340786	Oxidizer
D001F003		30		19-Sep-91	CH-NAT	MAF340785	Flammable liquid
D003	5			19-Sep-91	CH-NAT	MAF340785	Corrosive solid
D007	110			19-Sep-91	CH-NAT	MAF340785	Nickle solid
F007D003		450		19-Sep-91	CH-NAT	MAF339375	Poisonous liquids
MA99	40			19-Sep-91	CH-NAT	MAF339375	Inorganic salts
MA99	10			19-Sep-91	CH-NAT	MAF340785	Inorg/org salts
Nickel	40			19-Sep-91	CH-NAT	MAF339375	Nickel sulfamate
Batteries	100			20-Sep-91	CH-	See Comments	Not on manifest
D001D002		10		20-Sep-91	CH-NAT	MAF349892	Flammable corrosive liquid
D001D002D007		300		20-Sep-91	CH-BRT	MAF349894	Chronic acid
D001F003		150		20-Sep-91	CH-NAT	MAF349892	Flammable liquid
D002		10		20-Sep-91	CH-NAT	MAF349892	Corrosive liquid
D002		400		20-Sep-91	CH-BRT	MAF339535	Phosphoric acid
F002		440		20-Sep-91	CH-BRT	MAF339535	1,1,1 Trichloroethane
MA01		400		20-Sep-91	CH-NAT	MAF339535	Waste oil
MA01	30			20-Sep-91	CH-NAT	MAF349893	Oily debris
MA02	60			20-Sep-91	CH-BRT	MAF339535	PCB ballasts
MA99	5			20-Sep-91	CH-NAT	MAF349892	Non-flam. comp. gas
MA99	40			20-Sep-91	CH-NAT	MAF349893	Asb/Na lauryl sulf.
Nickel	200			20-Sep-91	CH-BRT	MAF349894	Nickel sulfamate
D001	20			23-Sep-91	CH-NAT	MAF318718	Flammable compressed gas
D001		10		23-Sep-91	CH-NAT	MAF318719	Organic peroxide liquid
D001D002		110		23-Sep-91	CH-NAT	MAF318718	Flammable corrosive liquid
D001D002D007		200		23-Sep-91	CH-NAT	MAF318717	Oxidizer;corrosive liquid
D001F003F005		425		23-Sep-91	CH-NAT	MAF318717	Flammable liquid
D002		150		23-Sep-91	CH-NAT	MAF318717	Corrosive liquid
D006	80			23-Sep-91	CH-NAT	MAF318717	Nickel
D009		15		23-Sep-91	CH-NAT	MAF318718	Poisonous B liquid

CH-Clean Harbors;CO-CYN OIL;LDL-Laidlaw;GCH-General Chemical;Romar-Romar,Beverly;EWR-Envir. Waste Resources.Murphy-Woburn,Mass

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HAZARDOUS WASTE DISPOSAL RECORD BY CHRONOLOGICAL ORDER Page 2

WASTE CODE	SOLID-lbs	LIQUID-lbs	LIQUID-GAL	DATE	HAULER	MANIFEST#	COMMENTS
MA01	200			23-Sep-91	CH-NAT	MAF318719	Oily debris
U069		9		23-Sep-91	CH-NAT	MAF318718	Hazardous liquid
D001		3		03-Oct-91	CH-NAT	MAF349905	Organic peroxide liquid
D001	2			03-Oct-91	CH-NAT	MAF349905	Flammable solid
D001	10			03-Oct-91	CH-NAT	MAF592702	Flam. compressed gas
D001D002		400		03-Oct-91	CH-NAT	MAF592702	Oxidizer,corrosive liquid
D001D002F003		40		03-Oct-91	CH-NAT	MAF349905	Flam. corrosive liquid
D001D007	70			03-Oct-91	CH-NAT	MAF349906	Oxidizer
D001F002		1100		03-Oct-91	CH-NAT	MAF592702	Flammable liquids
D002U134		1200		03-Oct-91	CH-NAT	MAF592702	Corrosive liquid
MA99	3			03-Oct-91	CH-NAT	MAF349906	Inorganics from plate shop
Nickel		40		03-Oct-91	CH-NAT	MAF349905	Plate shop closing
D001		300		04-Oct-91	CH-NAT	MAF592771	Flammable liquid
D001	5			04-Oct-91	CH-NAT	MAF592770	UN1325
D001	5			04-Oct-91	CH-NAT	MAF592771	Flam. compressed gas
D001D002		3		04-Oct-91	CH-NAT	MAF349907	Oxidizer;corrosive liquid
D001D002	2			04-Oct-91	CH-NAT	MAF349907	Bromine
D001F003		5		04-Oct-91	CH-NAT	MAF349907	Flammable liquid
D002D007		140		04-Oct-91	CH-NAT	MAF349907	Corrosive liquid
D002D007		10		04-Oct-91	CH-NAT	MAF592771	Corrosive liquid
D008D002			220	04-Oct-91	CH-BRT	MAF592769	Corrosive liquids
D009		12		04-Oct-91	CH-NAT	MAF592771	Poison B liquid
D022F003F005			10	04-Oct-91	CH-BRT	MAF592769	Chloroform/Ace/Tol
F003F005			55	04-Oct-91	CH-BRT	MAF592769	Acetone/Toluene
MA99	600			04-Oct-91	CH-BRT	MAF592769	NaOH flakes
MA99	5			04-Oct-91	CH-NAT	MAF592771	Organic salts
MA01			816	15-Oct-91	CH-MURPHY	MAF341235	Oil/quench tank Bldg 39
MA02			140	25-Oct-91	CH-BRT	MAF372026	PCB
MA99	100			25-Oct-91	CH-BRT	MAF372026	Non-hazardous
P030D006		80		25-Oct-91	CH-NAT	MAF372042	CdCN Solution
P106			55	25-Oct-91	CH-BRT	MAF372026	NaCN solid
D001D018			300	28-Oct-91	CO-BWR	MAF328092	UST gasoline/water
MA01	2500			22-Nov-91	CO-GCH	MAF327604	UST/oily debris-Mabardy
D001D002	5			25-Nov-91	CH-NAT	MAF373506	Bromine
D001D002U115		10		25-Nov-91	CH-NAT	MAF373505	Flammable;corrosive liquid
D001D005D011	10			25-Nov-91	CH-NAT	MAF373506	Oxidizers
D002D003		30		25-Nov-91	CH-NAT	MAF373505	Corrosive liquid
MA99	110			25-Nov-91	CH-NAT	MAF373505	Org/Inorganic solids;non-haz
P119D009U012	10			25-Nov-91	CH-NAT	MAF373505	Poisonous solid;Poison B
CR02		1875		10-Dec-91	DWOS-UIS	MAF293727	UST/sludge-Cali
MA02	2094			13-Dec-91	CH-BRT	MAF592324	Stokes furnace/PCB
MA02		374		13-Dec-91	CH-BRT	MAF592324	Stokes furnace/PCB
MA01	9500			24-Dec-91	CO-GCH	MAF362535	Oily solids/Bldg 60 sludge

DHS

SLCMT-MEM 27 August 1992

MEMORANDUM FOR

Deputy Director / Commander
Property Book Officer
Law Enforcement & Security Division
Materials Dynamic Branch

SUBJECT: Arms, Ammunition and Explosives Inventory for August 1992

1. A physical inventory of weapons listed on the Installation Sensitive Items Report (ISIR) was conducted IAW AR 710-2 by Heather A. Wickman and Robert McIntyre on 27 August 1992. All weapons were inventoried by serial number. A physical inventory of Box #4 (Seal #005827 and Seal #005836), stored in the Security Arms Room in Building 313, was conducted. Nine .38 revolvers were found with the following serial numbers: 36549, 37128, 37658, 37584, 37803, 37956, 38408, 723582, and 37419.

2. The following ammunition belonging to the Law Enforcement Security Division is stored in the security Arms room in Building 313N. This information is shown in Table 1.

a. 95 rounds of .38 Caliber Ball ammunition were kept loose in the Arms Room. 71 rounds were in a ready tray and 24 rounds were issued to guards on duty.
b. The items below were stored in sealed containers:

(1) Box #1, Seal #005803, 6 each M7A2 Grenades and 30 each M25A1 Grenades. This box had the same seal as last month, so a physical inventory was not conducted.
(2) Box #2, Seal #005837. This box had a different seal than last month, so a physical inventory was conducted: 95 each, .45 Caliber Ball, 583 each, .38 Caliber Ball and 63 each 4B/00 12 Gauge Cartridges.
(3) Box #3, Seal 005838. This box had a different seal than last month, so a physical inventory was conducted: 642 each, .38 Caliber Wadcutters.

3. The AA&E belonging to MRD is stored in Bunker 245 as follows. The quantities were obtained from the ISIR dated 27 August 1992. This information is shown in Table 2.

a. 2 barrels, HC-25 propellant powder, total weight 880 ounces.
b. 2 barrels, HC-33 propellant powder, total weight 1292 ounces.
c. 5 each, 1 lb. canisters BLUEDOT propellant powder, total weight 80 ounces.
d. 5 each, 1 lb. canisters BULLSEYE propellant powder, total weight 80 ounces.
e. 5 each, 1 lb. canisters IMR 4320 propellant powder, total weight 0 ounces.
f. 20 each, 1 lb. canisters IMR 4895 propellant powder, total weight 320 ounces.
g. 5 each, 1 lb. canisters UNIQUE propellant powder, total weight 80 ounces.
h. 5 each, 1 lb. canisters WINCH .748 propellant powder, total weight 80 ounces.
i. 1 each, 165 mm - M2 propellant powder, total weight 1923 ounces.
j. 1 each, barrel, IMR 5010 propellant powder, total weight 1440 ounces.

SLCMT-MEM

SUBJECT: Arms, Ammunition and Explosives Inventory for August 1992

4. Please see Tables 1 and 2 for more information.

Heather A. Wickman

Heather A. Wickman
AA&E Inventory Officer

Enclosures:
Table 1
Table 2

BUNKER 245, Date: 27 August 1992

TYPE OF PROPELLANT OR AMMUNITION	LAST INVENTORY (OUNCES)	EXPENDED (OUNCES)	THIS INVENTORY (OUNCES)	TYPE OF CONTAINER	SEAL NUMBERS IF SEALED	COMMENTS
CARTRIDGE 7.62 MM SLAP						
AK-47 BALL 5.45 MM						
PROPELLANT POWDER HC-25	1120	240	880	2 Drums		
PROPELLANT POWDER HC-33	1292	0	1292	2 Drums		
PROPELLANT POWDER BLUEDOT	80	0	80	Box#2	0098050 009851	
PROPELLANT POWDER BULLSEYE	80	0	80	Box #2	0098050 009851	
PROPELLANT POWDER IMR 4320	80	0*	0*	Box #3	009852 009853	* Turned in all 80 o
PROPELLANT POWDER IMR 4895	320	0	320	Box-20 Cans		
PROPELLANT POWDER UNIQUE	80	0	80	Box #3	009852 009853	
PROPELLANT POWDER WINCH .748	80	0	80	Box #3	009852 009853	
PROPELLANT POWDER 165MM M2	2003	80	1923	Wooden Box		
PROPELLANT POWDER IMR 5010	2160	720	1440	Barrel		

TABLE 2

BUILDING 313, Date: 27 August 1992

ITEM	CALIBER	LAST INVENTORY	THIS INVENTORY	EXPENDED	CONTAINER	SEAL NUMBERS	COMMENTS
GRENADE	CS	6	6	0	Box #1	005803	
GRENADE	BASEBALL	30	30	0	Box #1	005803	
BALL	.45	95	95	0	Box #2	005837	
BALL	.38	583	583	0	Box #2	005837	
WADCUTTER	.38	642	642	0	Box #3	005838	
4B/00	12 GUAGE	63	63	0	Box #2	005837	

TABLE 1

REQUEST FOR ISSUE AND TURN-IN OF AMMUNITION

For use of this form, see AR 710-2; the proponent agency is DCSLOG

1. Issue
2. Turn-In X

3. DOCUMENT NO: 2240-2006
4.
5. PAGE: 1 OF 1
6. DOCUMENT SERIAL NO: AA581 3864322

7. SEND TO: PBO/ISO USA MTL WAT. MA.
8. REQUEST FROM: HR: 9203-024
9. DATE MATERIEL REQUIRED
10. PRIORITY
11. ALLOCATION PERIOD
12. DODACC

13a. REQUESTED BY: F. SEITSINGER — 13b. DATE: 8-27-92 — 13c. SIGNATURE: [signature]
14a. APPROVED BY: R. J. GUARINO — 14b. DATE: 8-27-92 — 14c. SIGNATURE: [signature] J. Guarino

15. ITEM	16. DOCIC	17. NSN	18. NOMENCLATURE	19. UI	20. QTY REQUESTED/TURNED IN	21. TEC	22. ACTION CODE	23. QTY ISSUED/RECEIVED	24. LOT/SERIAL NO.	25. CC	26. POSTED BY	27. DATE
1		132000HC25	HC-25 PROPELLANT	OZ.	240							
2		1376004572882	165MM M2 PROPELLANT	OZ.	80							
3		1376010491454	IMR 5010 PROPELLANT	OZ.	720							

28. REMARKS: EXPENDED DURING AUG. 92 AT LAB RANGE

This inventory adjustment is Reflected in Table 2.

COMPLETED
RJG
AUG 27 1992

29. RELATED DOCUMENT SERIAL NOS

30a. ISSUED BY: F. SEITSINGER
30b. SIGNATURE: [signature]
30c. DATE: 8-27-92
31a. RECEIVED BY
31b. SIGNATURE
31c. DATE
32. TAMIS CONTROL NO

DA FORM 581 AUG 89 — EDITION OF MAY 64 IS OBSOLETE

SLCMT-DD (710)

10 August 1992

MEMORANDUM FOR See Distribution

SUBJECT: Additional Duty Assignment-Arms, Ammunition, and Explosives (AA&E) Inventory Officer

1. The following individuals are assigned the above duty for the period indicated in paragraph 4 below:

Primary: Heather Wickman, MEM Alternate: Michael Buonomo, MEM

2. Authority: AR 710-2, Par 2-53; AR 190-11, Par 2-6; AR 190-13 and AR 195-5.

3. Purpose: To conduct monthly inventory of AA&E in the Law Enforcement and Security Division, ranges located in Buildings #311 and 313, and bunkers 244 and 245 at MTL.

4. Period: AUGUST 1992

5. Special Instructions: An announced inspection and inventory is to be conducted, NLT the last day of the month, cited in paragraph 4 above, IAW references cited in paragraph 2 above. The inventory Officer will coordinate this inventory with the Property Book Officer (ext. 5057) at least 10 working days before the inventory. The MTL range personnel will be notified NLT 24 hours prior to the inspection. The Inventory Officer will oversee the count of all items of AA&E, discussed in paragraph 3 above. Record in the inventory form, the ending balance from the previous inventory, total receipts and issues since the previous inventory, and the current balance inventoried for all AA&E. The Inventory Officer will submit a written report to the Property Book Officer, the Chief, Law Enforcement & Security Division, and the Chief, Materials Dynamics Branch, within 5 working days of the completion of the inventory.

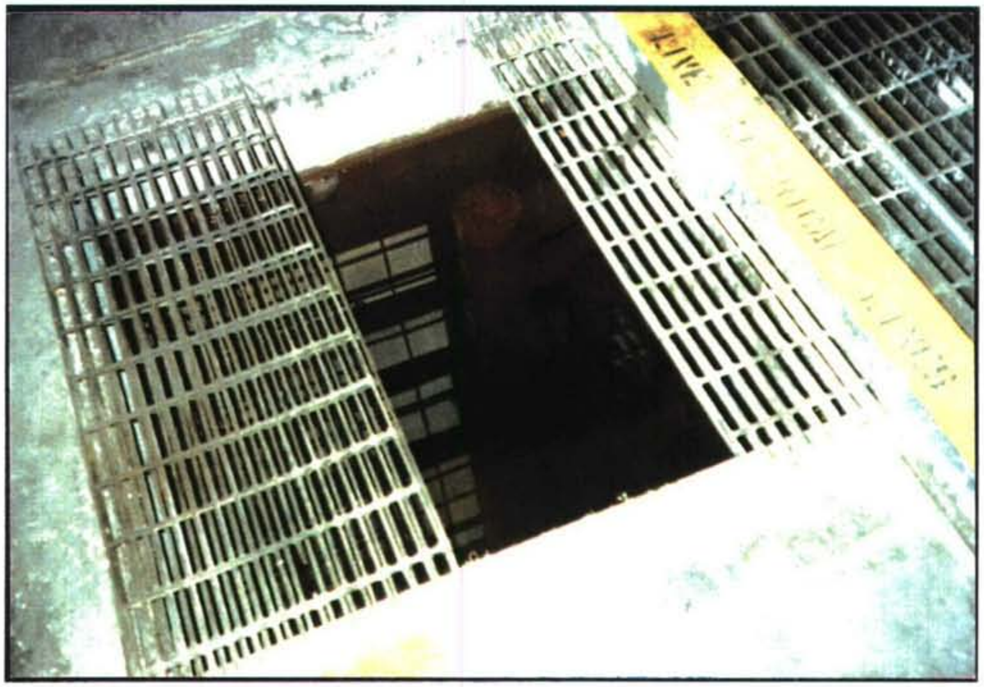
6. P.O.C. is Michael Quigg, Chief, Logistics Division at X5037.

James T. Naughton

JAMES T. NAUGHTON
MAJ, OD
Deputy Director/Commander

DISTRIBUTION:
CHIEF, SAFETY OFFICE, ATTN: SLCMT-DHS
CHIEF, LAW ENFORCEMENT & SECURITY DIVISION, ATTN: SLCMT-SC
CHIEF, LOGISTICS DIVISION, ATTN: SLCMT-LO
CHIEF, EQUIPMENT MANAGEMENT BRANCH, ATTN: SLCMT-LOE
GROUP LEADER, BALLISTIC IMPACT BEHAVIOR GROUP, ATTN; SLCMT-MPD
INVENTORY OFFICER, PRIMARY ATTN: SLCMT-MEC
INVENTORY OFFICER, ALTERNATE ATTN: SLCMT-MEC

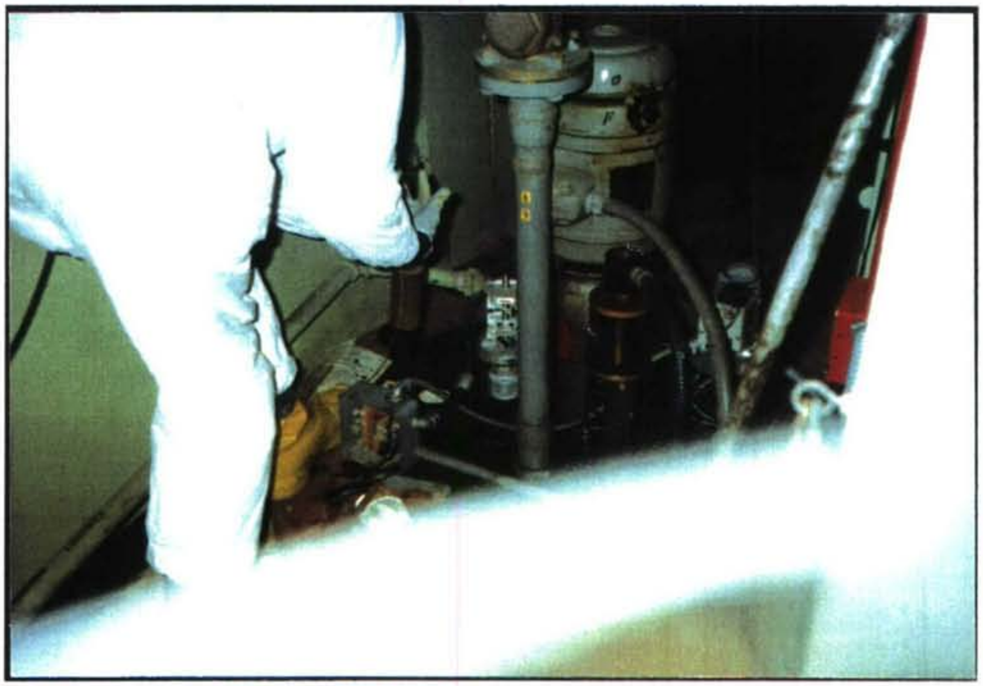
Container Sample 311SW02
Sump in Building 311



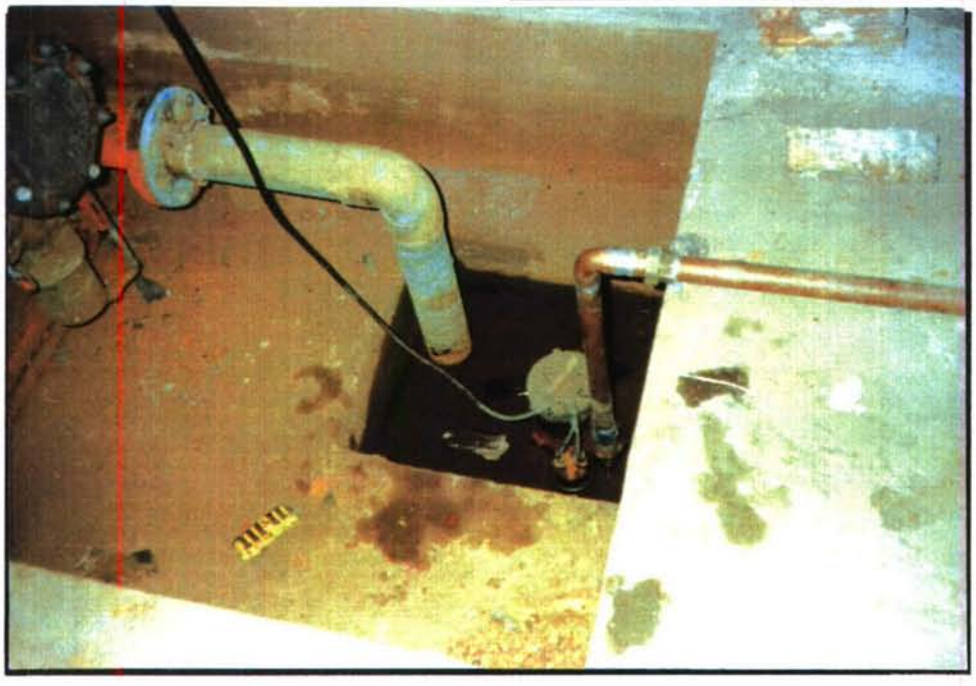
Container Sample 311SW03
Sump in Building 311

Container Sample 311SW04
Sump in Building 311

Container Sample 100SW01
Reactor Basement



Container Sample 100SW02
Sump in Reactor Basement

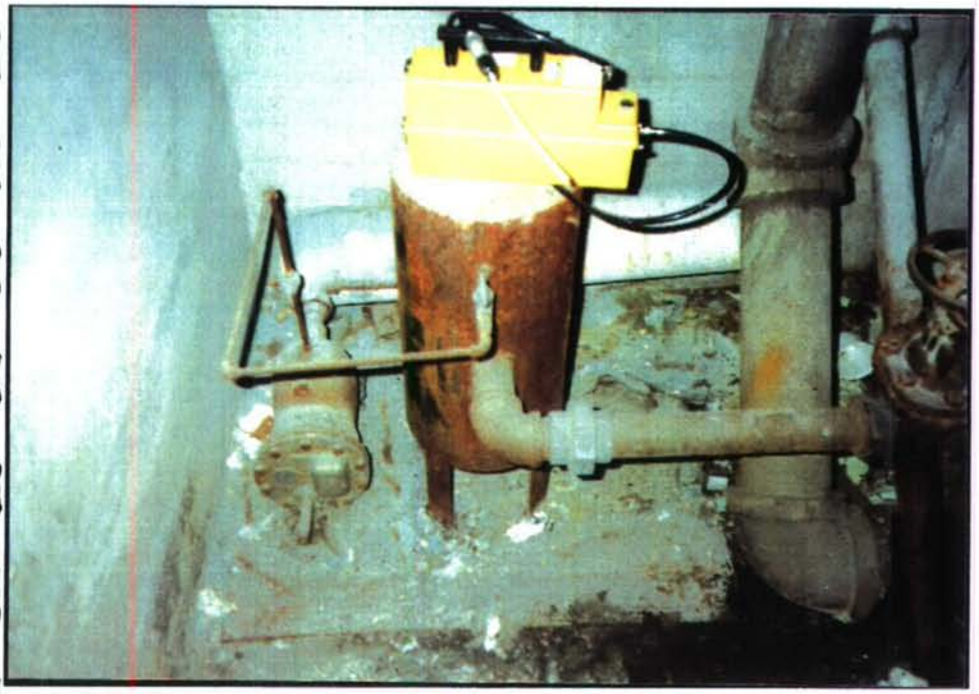


Container Sample 39SW01
Sump in Tunnel Beneath
Building 39

Container Sample 43SED01
Sump in Building 43

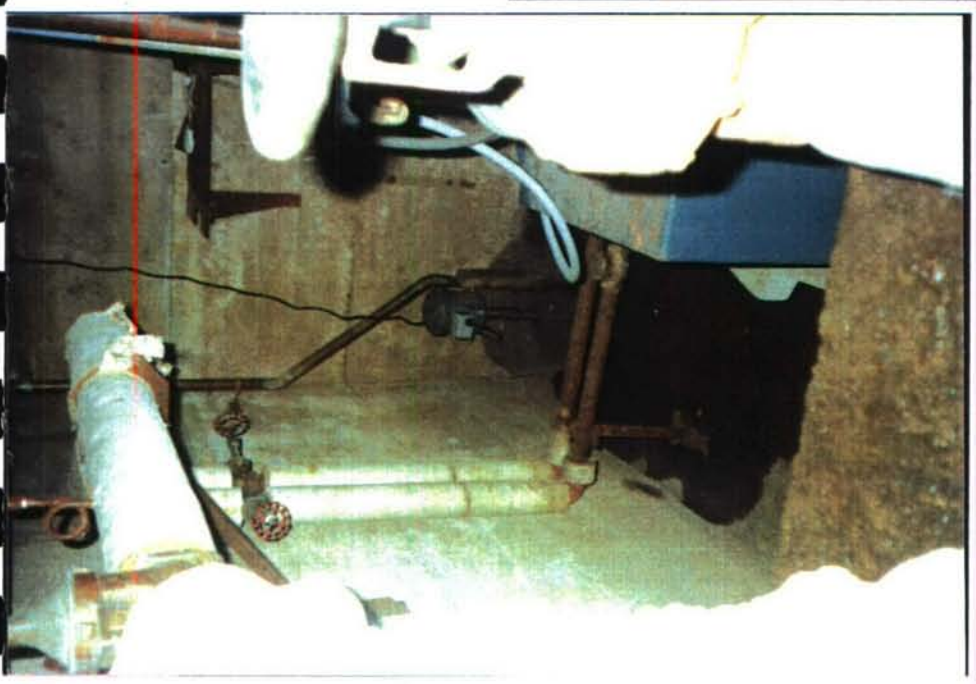
Container Sample 43SED02
Tank in Building 43

Container Sample 43SW01
Sump in Building 43



Container Sample 311SED03
Sump in Building 311

Container Sample 311SED04
Tank in Building 311



Container Sample 243SED01
Cistern Adjacent to Building 243

Access to Building
313C Cistern

Building 313C Cistern
Location of Samples
313CSW01 and 313CSED01

Container Sample 312SED01
Basin In Hallway of Building 312
(Between Plate Shop and
Beryllium Machining Laboratory)

Sanitary Sewer Manhole No. 74

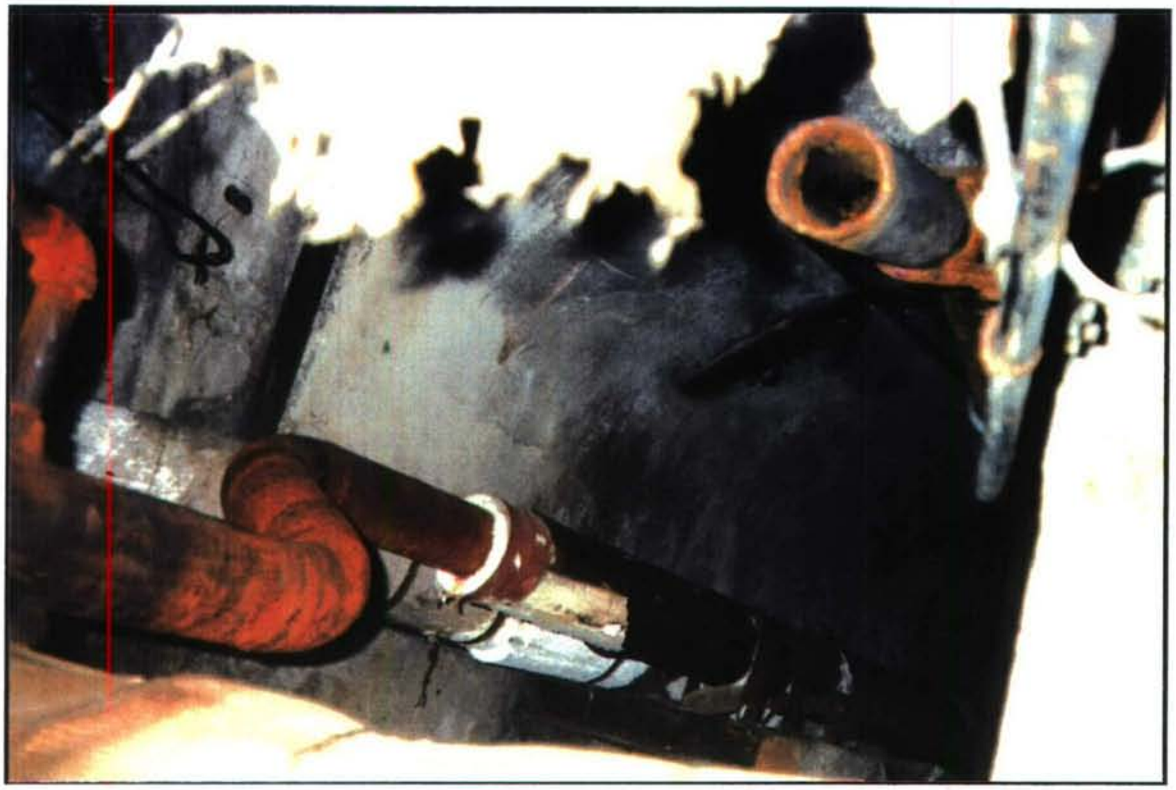
Sediment Sampling in Sanitary Sewer

Building 43 - Surface Radiation Removability Study - Instrument Survey

Building 43 Surface Radiation Removability Study - Floor Tile Removal

Loose Insulation Material (Possibly Asbestos-Containing) in Tunnel Between Buildings 60 and 313

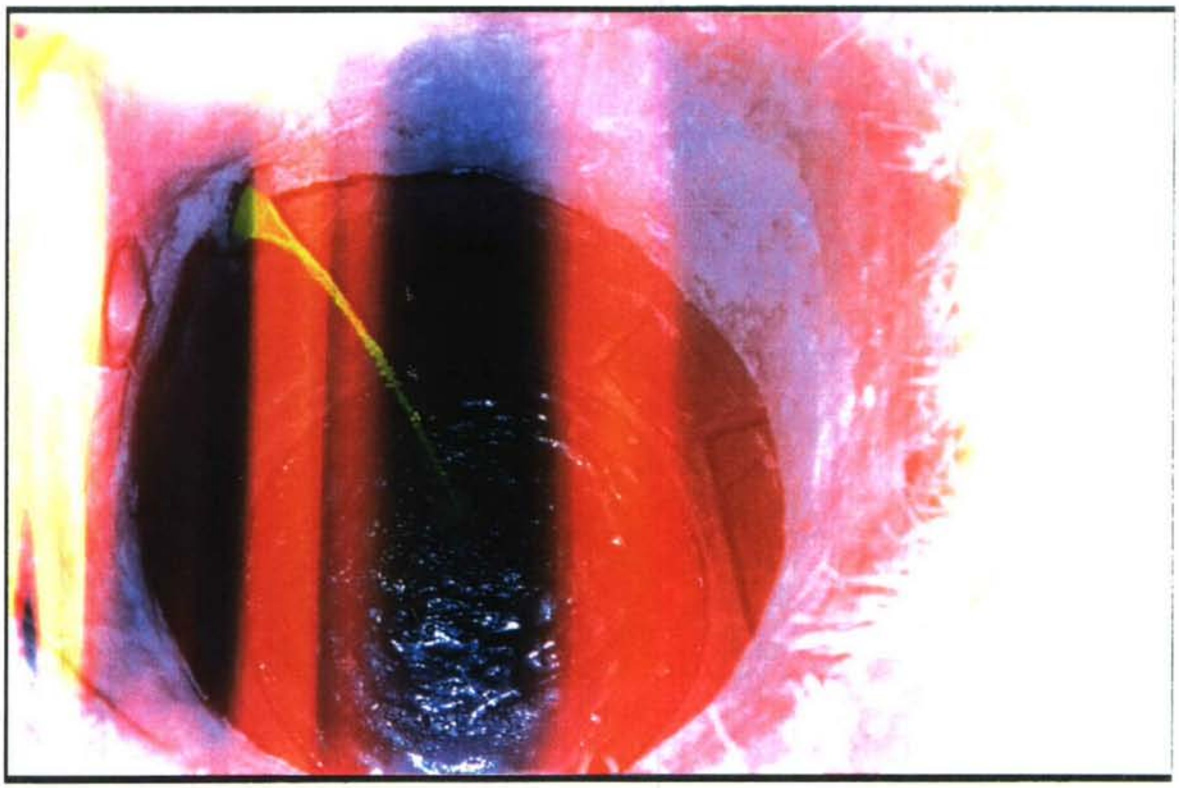
Tunnel From Building 60 to Building 313 Facing North



Tunnel Junction Beneath Building 227 Area of Former Leak. No Leakage Apparent.

Close-Up of Building 60/227 Tunnel Junction

Globules of Black Oil in Sanitary Sewer



Dye Testing of Cistern Adjacent to Building 243

APPENDIX N

SUMMARY OF CHEMICAL AND RADIOLOGICAL ANALYTICAL DATA USED FOR RISK ASSESSMENT

TABLE N-1 SUMMARY OF CHEMCIAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Acenaphthene	24	117	0.0709	6.33	0.041	4.1	7	23	0.0906	2	0.041	0.041
Acenaphthylene	20	117	0.0921	0.611	0.033	4.6	7	23	0.183	7.5	0.033	0.033
Acetone	2	103	0.016	0.051	0.011	3.3	0	20			3.3	3.3
Acrolein	0	96			15	15	0	20			15	15
Acrylonitrile	0	96			2	2	0	20			2	2
Aldrin	5	135	0.0022	0.051	0.0014	1.3	0	25			0.0014	1.3
Alkanes	4	4	0.446	7.85								
Alpha-Chlordane	12	13	0.005	1.545	1	1						
Alpha-Endosulfan	5	118	0.00248	0.0334	0.001	1	1	24	0.00237	0.00237	0.001	0.4
Alpha-Hexachlorocyclohexane	2	134	0.0271	0.0347	0.0028	1.3	0	25			0.0028	1.3
Aluminum	147	147	23.5	40100			26	26	3160	69700		
Amino-4,6-dinitrotoluene, 2-	0	7			0.5	0.5						
Anthracene	10	117	0.054	14	0.29	7.1	3	23	1.49	6.2	0.71	0.71
Antimony	1	144	5.58	5.58	0.373	19.6	0	26			0.373	19.6
Arsenic	97	143	2.4	52	2.22	4.4	17	26	3.17	58	2.5	2.5
Atrazine	0	103			0.065	0.65	0	23			0.065	0.065
Barium	145	147	10.3	199	79.8	80	24	26	7.65	177	79.8	80
Benzene	2	119	0.1	0.258	0.003	0.1	0	22			0.005	0.1
Benzo (a) anthracene	57	117	0.0852	11.8	0.041	3	8	23	0.144	6.05	0.041	0.041
Benzo (a) pyrene	13	117	0.827	10.7	0.16	12	3	23	3.15	6.87	1.2	1.2
Benzo (b) fluoranthene	29	117	0.679	11.6	0.25	3.6	5	23	1.83	7.57	0.31	0.31
Benzo (g,h,i) perylene	29	117	0.378	8.09	0.18	2.4	6	23	0.656	4.4	0.18	0.18
Benzo (k) fluoranthene	31	117	0.265	8.58	0.13	8	7	23	0.36	6.29	0.13	0.13
Benzoic acid	0	110			1.7	31	0	23			3.1	3.1
Benzyl alcohol	1	110	1.29	1.29	0.032	3	0	23			0.032	0.032
Beryllium	99	147	0.1645	5.02367	0.331	0.684	17	26	0.512	2.7	0.331	0.427
Beta-Endosulfan	28	118	0.00077	0.127	0.0007	2.4	2	24	0.00119	0.014	0.0007	2.4
Beta-Hexachlorocyclohexane	1	128	0.0214	0.0214	0.0077	3.6	0	25			0.0077	1.3
Bichlorobenzene - nonspecific	1	96	0.277	0.277	0.2	0.2	0	20			0.2	0.2
Bis (2-chloroethyl) ether	0	117			0.33	3.6	0	23			0.36	0.36
Bis (2-chloroethyoxy) methane	0	110			0.19	3	0	23			0.19	0.19
Bis (2-chloroisopropyl) ether	0	110			0.33	4.4	0	23			0.44	0.44
Bis (2-ethylhexyl) phthalate	7	117	1.08	7.01	0.39	4.8	2	23	3	4.1	0.48	0.48
Boron	1	3	10.6	10.6	7.37	7.37						
Bromodichloromethane	0	117			0.004	5	0	22			0.2	5
Bromofluorobenzene, 4-	0	96			0.6	0.6	0	20			0.6	0.6
Bromoform	0	119			0.004	0.2	0	22			0.004	0.2
Bromomethane	0	103			0.011	0.26	0	20			0.26	0.26
Bromophenylphenyl ether, 4-	0	110			0.041	3	0	23			0.041	0.041
Butanone, 2-	1	103	0.018	0.018	0.011	4.3	0	20			4.3	4.3
Butylbenzyl phthalate	4	110	0.51	1.1	0.33	18	1	23	2.12	2.12	1.8	1.8
Cadmium	16	148	0.771	13	0.447	1.2	1	26	2.18	2.18	0.951	1.2
Calcium	148	148	760	16700			26	26	872	31100		
Carbon disulfide	0	103			0.005	0.6	0	20			0.6	0.6
Carbon tetrachloride	0	119			0.002	0.31	0	22			0.002	0.31
Chlordane	31	130	0.049	9.36	0.028	3.3	5	25	0.102	1.9	0.0684	0.68
Chloroaniline, 4-	0	110			0.33	6.3	0	23			0.63	0.63
Chlorobenzene	0	119			0.002	0.1	0	22			0.002	0.1
Chloroethane	0	119			0.01	0.64	0	22			0.01	0.64
Chloroethylvinyl ether, 2-	0	119			0.005	0.5	0	22			0.005	0.5

TABLE N-1 SUMMARY OF CHEMCIAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Chloroform	0	119			0.002	0.24	0	22			0.015	0.24
Chloromethane	0	119			0.005	0.96	0	22			0.005	0.96
Chloronaphthalene, 2-	0	117			0.24	3.2	0	23			0.24	0.24
Chlorophenol, 2-	0	110			0.055	3	0	23			0.055	0.055
Chlorophenylmethyl sulfide, p-	0	110			0.097	3.7	0	23			0.097	0.097
Chlorophenylmethyl sulfone, p-	0	117			0.066	6.9	0	23			0.066	0.066
Chlorophenylmethyl sulfoxide, p-	0	117			0.27	3.2	0	23			0.32	0.32
Chlorophenylphenyl ether, 4-	0	110			0.17	3	0	23			0.17	0.17
Chromium	147	148	8.065	274	9.31	9.31	26	26	6.79	127		
Chrysene	50	117	0.0759	9.33	0.032	4.5	8	23	0.166	9.24	0.032	0.032
Cobalt	129	148	4.35	704	1.5	18.6	22	26	4.23	76.3	2.5	18.6
Copper	146	148	5.61	2150	62.9	63	25	26	7.99	136	2.84	2.84
Cyanide	12	109	0.269	2.07	0.25	4900	1	20	0.396	0.396	0.25	0.25
DDD	36	136	0.00326	3.48	0.0027	0.39	3	25	0.00835	0.0466	0.0027	0.064
DDE	43	136	0.00315	5.94	0.0027	0.4	5	25	0.00363	0.251	0.0027	0.068
DDT	41	130	0.00401	5.2	0.0035	4.1	3	25	0.0222	0.191	0.0035	0.1
Delta-Hexachlorocyclohexane	1	131	0.0183	0.0218	0.005	0.57	0	24			0.0085	0.21
Di-N-butyl phthalate	3	110	1.68	6.2	0.33	13	0	23			1.3	1.3
Di-N-octyl phthalate	2	117	0.614	1.09	0.23	5.9	0	23			0.23	0.23
Dibenz (a,h) anthracene	10	117	0.528	1.65	0.2	3.1	3	23	0.494	0.967	0.31	0.31
Dibenzofuran	3	110	0.0583	1.09	0.038	3	0	23			0.038	0.038
Dibromochloromethane	0	119			0.002	0.25	0	22			0.002	0.25
Dibromochloropropane	0	103			0.071	0.71	0	23			0.071	0.071
Dichlorobenzene, 1,2-	0	129			0.001	0.42	0	25			0.01	0.042
Dichlorobenzene, 1,3-	0	130			0.002	0.33	0	25			0.006	0.14
Dichlorobenzene, 1,4-	0	129			0.001	0.34	0	25			0.008	0.034
Dichlorobenzidine, 3,3'-	0	110			0.2	16	0	23			1.6	1.6
Dichloroethane, 1,1-	0	119			0.002	0.49	0	22			0.007	0.49
Dichloroethane, 1,2-	0	119			0.003	0.32	0	22			0.005	0.32
Dichloroethenes, 1,2- (cis and trans)	0	119			0.002	0.32	0	22			0.006	0.32
Dichloroethylene, 1,1-	0	119			0.012	0.27	0	22			0.012	0.27
Dichlorophenol, 2,4-	0	110			0.065	3	0	23			0.065	0.065
Dichloropropane, 1,2-	0	119			0.002	0.53	0	22			0.01	0.53
Dichloropropane, 1,3-	0	103			0.001	0.2	0	20			0.2	0.2
Dichloropropene, 1,3- trans	0	119			0.002	0.6	0	22			0.002	0.6
Dichloropropylene, 1,3- cis	0	119			0.003	0.6	0	22			0.003	0.6
Dicyclopentadiene	0	103			0.57	5.7	0	23			0.57	0.57
Dieldrin	33	127	0.00268	4.01	0.0016	0.86	2	23	0.005	0.0169	0.0016	0.079
Diethyl phthalate	0	110			0.24	3	0	23			0.24	0.24
Dimethyl phthalate	0	110			0.063	3	0	23			0.063	0.063
Dimethylbenzene,.1,2- / o-Xylene	0	7			0.005	0.006					•	
Dimethylbenzene, 1,3- / m-Xylene	1	103	0.286	0.286	0.005	0.23	0	20			0.23	0.23
Dimethylphenol, 2,4-	0	110			0.33	30	0	23			3	3
Dinitroaniline, 2,6-	0	103			0.57	5.7	0	23			0.57	0.57
Dinitroaniline, 3,5-	0	110			0.5	16	0	23			1.6	1.6
Dinitrobenzene, 1,3-	0	5			0.504	1.31						
Dinitrophenol, 2,4-	0	110			1.7	47	0	23			4.7	4.7
Dinitrotoluene, 2,4-	1	121	6.2	6.2	0.39	14	0	23			1.4	1.4
Dinitrotoluene, 2,6-	1	121	8.15	8.15	0.2	5.3	0	23			0.32	0.32
Diphenylhydrazine, 1,2-	0	103			0.52	5.2	0	23			0.52	0.52

TABLE N-1 SUMMARY OF CHEMCIAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Dithiane	0	117			0.065	2.4	0	23			0.065	0.065
Endosulfan sulfate	0	121			0.0005	2	0	25			0.0005	1.2
Endrin	22	132	0.00829	0.792	0.0065	1.3	2	24	0.0121	0.037	0.0065	1.3
Endrin aldehyde	0	103			1.8	18	0	23			1.8	1.8
Endrin ketone	0	121			0.0005	2	0	25			0.0005	0.28
Ethylbenzene	1	119	0.535	0.535	0.003	0.19	0	22			0.01	0.19
Fluoranthene	60	117	0.0323	20.1	0.032	5.2	9	23	0.099	6.2	0.032	0.032
Fluorene	19	110	0.16	6.24	0.065	3	5	23	0.217	0.996	0.065	0.065
Gamma scan/Gamma screen	0	4			1	4.5						
Gamma-Chlordane	8	12	0.014	1.72	0.004	0.004						
Gamma-Hexachlorocyclohexane	11	136	0.0013	0.0315	0.001	0.43	0	25			0.001	0.1
HMX	0	5			2	4.42						
Heptachlor	16	136	0.00247	0.057	0.001	0.28	1	25	0.00248	0.00248	0.0022	0.24
Heptachlor epoxide	35	135	0.00194	0.867	0.0013	0.74	5	25	0.00183	0.023	0.0013	0.48
Hexachlorobenzene	0	117			0.08	2.6	0	23			0.08	0.08
Hexachlorobiphenyls	2	2	0.24	0.336								
Hexachlorobutadiene	0	117			0.29	9.7	0	23			0.97	0.97
Hexachlorocyclopentadiene	0	110			0.33	5.2	0	23			0.52	0.52
Hexachloroethane	0	117			0.14	18	0	23			1.8	1.8
Hexanone, 2-	0	103			0.011	1	0	20			1	1
Indeno (1,2,3-cd) pyrene	9	117	0.322	14.3	0.21	24	3	23	4.42	7.66	2.4	2.4
Iron	148	148	1730	130000			26	26	4510	161000		
Isodrin	6	132	0.031	0.343	0.003	0.48	0	25			0.003	0.48
Isophorone	0	110			0.33	3.9	0	23			0.39	0.39
Lead	108	144	8.29	7200	7.44	92.3	20	26	12	506	7.44	92.3
Magnesium	148	148	1200	14900			26	26	1040	34600		
Malathion	0	117			0.18	4.8	0	23			0.18	0.18
Manganese	135	148	98.85	1290	292	292	25	26	41.3	2570	292	292
Mercury	63	139	0.023	4.5	0.018	0.05	5	26	0.0743	0.119	0.018	0.05
Methoxychlor	1	120	0.0607	0.0607	0.0359	10	0	25			0.0359	0.26
Methyl-4,6,dinitrophenol, 2-	0	117			0.8	20	0	23			0.8	0.8
Methyl-4-chlorophenol, 3-	0	110			0.33	9.3	0	23			0.93	0.93
Methylene chloride	0	117			0.005	4.4	0	22			0.01	4.4
Methylisobutyl ketone	0	103			0.011	0.63	0	20			0.63	0.63
Methylnaphthalene, 2-	23	110	0.0628	7.52	0.032	3	4	23	0.0577	0.553	0.032	0.032
Methylphenol, 2-	0	110			0.098	3	0	23			0.098	0.098
Methylphenol, 4-	0	110			0.24	3	0	23			0.24	0.24
Mirex	0	103			0.14	1.4	0	23			0.14	0.14
Molybdenum	0	3			1.49	1.49						
N-Nitrosodi-N-propylamine	0	110			0.11	11	0	23			1.1	1.1
N-Nitrosodimethylamine	0	103			0.46	4.6	0	23			0.46	0.46
N-Nitrosodiphenylamine	1	110	10.8	10.8	0.29	3	0	23			0.29	0.29
Naphthalene	4	117	2.6	5.1	0.28	7.4	0	23			0.74	0.74
Nickel	148	148	3.06	744			25	26	8.17	90.8	2.74	2.74
Nitrite, nitrate - nonspecific	4	4	4.45	6.28								
Nitroaniline, 2-	0	110			1.7	31	0	23			3.1	3.1
Nitroaniline, 3-	0	110			1.7	30	0	23			3	3
Nitroaniline, 4-	0	110			1.7	31	0	23			3.1	3.1
Nitrobenzene	0	115			0.33	18	0	23			1.8	1.8
Nitrophenol, 2-	0	110			0.33	11	0	23			1.1	1.1

TABLE N-1 SUMMARY OF CHEMCIAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Nitrophenol, 4-	0	110			1.7	33	0	23			3.3	3.3
Nitrosodi-N-propylamine	0	7			0.36	3.6						
Nitrotoluene, 2-	0	7			0.5	4.26						
Nitrotoluene, 3-	0	110			0.34	3.4	0	23			0.34	0.34
Oxathiane, 1,4-	0	117			0.075	2.5	0	23			0.075	0.075
PCB 1016	1	137	0.14	0.14	0.063	1	0	26			0.1	0.32
PCB 1221	0	125			0.063	1.9	0	26			0.1	1.9
PCB 1232	0	125			0.063	1.9	0	26			0.1	1.9
PCB 1242	0	125			0.063	1.9	0	26			0.1	1.9
PCB 1248	0	126			0.063	5.1	0	26			0.1	1.9
PCB 1254	0	127			0.0479	8.95	0	26			0.0479	3.8
PCB 1260	18	137	0.0745	4.87	0.0479	0.79	3	26	0.316	1.56	0.0479	0.79
PCB 1262	0	103			6.3	63	0	23			6.3	6.3
Parathion	0	117			0.46	17	0	23			1.7	1.7
Pentachlorobiphenyls	1	1	0.237	0.237								
Pentachlorophenol	0	110			0.76	20	0	23			0.76	0.76
Pentaerythritol tetranitrate	0	7			1.35	1.35						
Pentafluorophenol	0	7			1.01	1.01						
Phenanthrene	56	117	0.0765	15	0.032	4.1	9	23	0.131	12.6	0.032	0.032
Phenol	0	110			0.052	3	0	23			0.052	0.052
Polynuclear aromatic hydrocarbon	6	6	0.224	3.3025								
Potassium	147	148	182	9020	142	142	25	26	378	10400	142	142
Pyrene	65	117	0.148	26.9	0.083	4.2	8	23	0.297	9.33	0.083	0.083
RDX	0	11			1.28	3.94						
Selenium	0	143			1.95	20.7	1	26	37.8	37.8	1.95	20.7
Silver	8	144	0.045	38.9	0.034	0.803	0	26			0.699	0.803
Sodium	131	132	53.1	2690	38.7	38.7	23	23	71.2	1270		
Styrene	0	103			0.005	0.6	0	20			0.6	0.6
Sulfide	5	5	72.2	277.5								
Supona	0	103			0.92	9.2	0	23			0.92	0.92
Tetryl	0	5			2.11	4.86						
Tellurium	0	3			5.48	5.48						
Tetrachlorobiphenyls	1	1	0.24	0.24								
Tetrachloroethane, 1,1,2,2-	2	119	0.211	0.391	0.002	0.2	0	22			0.003	0.2
Tetrachloroethene	2	119	0.002	0.187	0.002	0.16	0	22			0.008	0.16
Tetrazene	1	7	1.42	1.42	1.22	1.22						
Thallium	0	148			0.2	67.6	0	26			34.3	67.6
Tin	16	22	3.63	52.8	5.39	6	3	3	4.37	39.1		
Toluene	3	119	0.102	0.517	0.006	0.1	0	22			0.006	0.1
Total organic carbon	15	15	2450	350000			6	6	1250	8440		
Toxaphene	0	114			0.226	12	0	25			0.226	12
Trichlorobenzene, 1,2,3-	0	117			0.032	2.9	0	23			0.032	0.032
Trichlorobenzene, 1,2,4-	0	117			0.17	2.9	0	23			0.22	0.22
Trichlorobiphenyls	1	1	0.24	0.24								
Trichloroethane, 1,1,1-	0	119			0.004	0.2	0	22			0.006	0.2
Trichloroethane, 1,1,2-	0	119			0.003	0.33	0	22			0.003	0.33
Trichloroethylene	1	119	0.348	0.348	0.002	0.23	0	22			0.002	0.23
Trichlorophenol, 2,4,5-	0	110			0.49	20	0	23			0.49	0.49
Trichlorophenol, 2,4,6-	0	110			0.061	20	0	23			0.061	0.62
Trifluorochloromethane	0	103			0.005	0.23	0	20			0.23	0.23

TABLE N-1 SUMMARY OF CHEMCIAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Trinitrobenzene, 1,3,5-	0	5			0.922	1.84						
Trinitrophenol, 2,4,6-	0	7			2.93	2.93						
Trinitrotoluene, 2,4,6-	0	11			2	4.78						
Uranium	0	23			0.108	92.3	0	3			36.9	92.3
Vanadium	132	148	13.6	126.767	61.7	61.7	23	26	5.79	222	61.7	61.7
Vapona	0	103			0.068	0.68	0	23			0.068	0.068
Vinyl acetate	0	103			0.011	1	0	20			1	1
Vinyl chloride	0	119			0.008	1.8	0	22			0.008	1.8
Xylenes	0	96			0.78	0.78	0	20			0.78	0.78
Zinc	147	148	17.4	1200	796	796	26	26	7.65	290		
pH	40	40	4.71	16.8			9	9	6.65	8.2		

TABLE N-2 SUMMARY OF RADIOLOGICAL DATA FOR SITE-RELATED SOIL AND BACKGROUND SOIL LOCATIONS

	SITE-RELATED SOIL SAMPLES						BACKGROUND SOIL SAMPLES					
	Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g		Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Alpha gross	87	88	1	38	5	5	21	21	1	41		
Beta gross	88	88	12	41			21	21	12	38	0.0001	0.0001
Cesium 137	4	14	0.07	1.2	0.0001	0.0001						
Plutonium 238 isotope	0	4			1	1						
Plutonium 239 isotope	0	4			1	1						
Thorium 232	14	14	0.8	2.5								
Uranium 234	98	98	0.3	2.4			23	23	0.1	1.3	0.0001	0.0001
Uranium 235	30	98	0.1	0.2	0.0001	0.6	5	23	0.1	0.1	0.0001	0.0001
Uranium 238	98	98	0.2	3.4			23	23	0.2	1.2	0.0001	0.0001

TABLE N-3 SUMMARY OF CHEMCIAL DATA FOR PARK AND YACHT CLUB SOIL LOCATIONS

	PARK						YACHT CLUB					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Acenaphthene	4	17	0.084	1.47	0.041	4.1	1	4	0.699	0.699	0.041	0.041
Acenaphthylene	7	17	0.163	4.19	0.033	4.6	3	4	0.151	12	0.033	0.033
Acetone	4	17	0.012	0.016	0.011	3.3	0	4			3.3	3.3
Acrolein	0	12			15	15	0	4			15	15
Acrylonitrile	0	12			2	2	0	4			2	2
Aldrin	0	17			0.0014	1.3	0	4			0.0014	0.014
Alkanes	2	2	0.236	0.406								
Alpha-Chlordane	3	5	0.007	0.058	0.002	0.002						
Alpha-Endosulfan	1	17	0.00254	0.00254	0.001	1	0	4			0.001	0.01
Alpha-Hexachlorocyclohexane	0	17			0.0028	0.028	0	4			0.0028	0.028
Aluminum	17	17	8810	24833.3			4	4	8840	25400		
Anthracene	3	17	1.59	14.5	0.54	5.4	1	4	6.2	6.2	0.71	0.71
Antimony	0	17			4.79	19.6	0	4			19.6	19.6
Arsenic	15	16	4.16	24	2.5	2.5	3	4	2.77	15.5	2.5	2.5
Atrazine	0	12			0.065	0.065	0	4			0.065	0.065
Barium	17	17	33.8	302.933			4	4	32.4	468		
Benzene	0	17			0.003	0.1	0	4			0.1	0.1
Benzo (a) anthracene	10	17	0.257	31.5	0.041	3	3	4	0.42	12	0.041	0.041
Benzo (a) pyrene	3	17	3.14	36.6	0.38	3.8	1	4	6.2	6.2	1.2	1.2
Benzo (b) fluoranthene	5	17	0.878	15.4	0.31	3.6	2	4	1.11	14.8	0.31	0.31
Benzo (g,h,i) perylene	6	17	0.777	13.6	0.18	2.4	3	4	0.743	23.7	0.18	0.18
Benzo (k) fluoranthene	8	17	0.387	23.6	0.13	8	3	4	0.445	24.7	0.13	0.13
Benzoic acid	0	17			1.7	20	0	4			3.1	3.1
Benzyl alcohol	0	17			0.032	3	0	4			0.032	0.032
Beryllium	15	17	0.271	1.4	0.427	0.684	3	4	0.567	1.41	0.427	0.427
Beta-Endosulfan	3	17	0.00154	0.0541	0.0007	2.4	2	4	0.00246	0.00481	0.0007	2.4
Beta-Hexachlorocyclohexane	0	17			0.0077	3.6	0	4			0.0077	0.077
Bichlorobenzene - nonspecific	0	12			0.2	0.2	0	4			0.2	0.2
Bis (2-chloroethyl) ether	0	17			0.33	3.3	0	4			0.36	0.36
Bis (2-chloroethyoxy) methane	0	17			0.19	3	0	4			0.19	0.19
Bis (2-chloroisopropyl) ether	0	17			0.3	3	0	4			0.44	0.44
Bis (2-ethylhexyl) phthalate	0	17			0.39	3.9	0	4			0.48	0.48
Boron	0	1			7.37	7.37						
Bromodichloromethane	0	17			0.003	0.2	0	4			0.2	0.2
Bromofluorobenzene, 4-	0	12			0.6	0.6	0	4			0.6	0.6
Bromoform	0	17			0.018	0.2	0	4			0.2	0.2
Bromomethane	0	17			0.01	0.26	0	4			0.26	0.26
Bromophenylphenyl ether, 4-	0	17			0.041	3	0	4			0.041	0.041
Butanone, 2-	0	17			0.01	4.3	0	4			4.3	4.3
Butylbenzyl phthalate	1	17	0.476	0.476	0.3	3	0	4			1.8	1.8
Cadmium	0	18			0.447	1.2	1	4	2.12	2.12	1.2	1.2
Calcium	18	18	2260	9820			4	4	2680	5600		
Carbon disulfide	0	17			0.005	0.6	0	4			0.6	0.6
Carbon tetrachloride	0	17			0.005	0.31	0	4			0.31	0.31
Chlordane	4	17	0.324	1.7	0.0684	30	0	4			0.0684	0.68
Chloroaniline, 4-	0	17			0.3	3	0	4			0.63	0.63
Chlorobenzene	0	17			0.003	0.1	0	4			0.1	0.1
Chloroethane	0	17			0.022	0.64	0	4			0.64	0.64
Chloroethylvinyl ether, 2-	0	17			0.048	0.5	0	4			0.5	0.5
Chloroform	0	17			0.002	0.24	0	4			0.24	0.24

TABLE N-3 SUMMARY OF CHEMCIAL DATA FOR PARK AND YACHT CLUB SOIL LOCATIONS

Chemical Name	PARK Freq. of Detection Hits	PARK Freq. of Detection Total	PARK Range of Detected Values, mg/kg Min.	PARK Range of Detected Values, mg/kg Max.	PARK Range of Detection Limits, mg/kg Min.	PARK Range of Detection Limits, mg/kg Max.	YACHT CLUB Freq. of Detection Hits	YACHT CLUB Freq. of Detection Total	YACHT CLUB Range of Detected Values, mg/kg Min.	YACHT CLUB Range of Detected Values, mg/kg Max.	YACHT CLUB Range of Detection Limits, mg/kg Min.	YACHT CLUB Range of Detection Limits, mg/kg Max.
Chloromethane	0	17			0.01	0.96	0	4			0.96	0.96
Chloronaphthalene, 2-	0	17			0.24	3.2	0	4			0.24	0.24
Chlorophenol, 2-	0	17			0.055	3	0	4			0.055	0.055
Chlorophenylmethyl sulfide, p-	0	17			0.097	3.7	0	4			0.097	0.097
Chlorophenylmethyl sulfone, p-	0	17			0.066	6.9	0	4			0.066	0.066
Chlorophenylmethyl sulfoxide, p-	0	17			0.27	2.7	0	4			0.32	0.32
Chlorophenylphenyl ether, 4-	0	17			0.17	3	0	4			0.17	0.17
Chromium	18	18	15.7	44.4			4	4	16.6	51.1		
Chrysene	9	17	0.279	33.9	0.032	4.5	3	4	0.416	12	0.032	0.032
Cobalt	17	18	7.32	89.3	1.5	1.5	4	4	5.78	17.7		
Copper	18	18	10.4	410			4	4	20	438		
Cyanide	2	17	0.397	0.429	0.25	5	2	4	0.306	0.506	0.25	0.25
DDD	4	17	0.0444	1.93	0.0027	0.027	3	4	0.0044	0.0804	0.0027	0.0027
DDE	7	17	0.008	6.33	0.0027	0.027	1	4	0.0171	0.0171	0.0027	0.027
DDT	4	17	0.0101	3.83	0.0035	4.1	1	4	0.102	0.102	0.0035	0.035
Delta-Hexachlorocyclohexane	0	17			0.005	0.085	0	4			0.0085	0.085
Di-N-butyl phthalate	0	17			0.3	3	0	4			1.3	1.3
Di-N-octyl phthalate	0	17			0.23	5.9	0	4			0.23	0.23
Dibenz (a,h) anthracene	2	17	0.468	3.34	0.2	2	0	4			0.31	0.31
Dibenzofuran	0	17			0.038	3	1	4	0.635	0.635	0.038	0.038
Dibromochloromethane	0	17			0.014	0.25	0	4			0.25	0.25
Dibromochloropropane	0	12			0.071	0.071	0	4			0.071	0.071
Dichlorobenzene, 1,2-	0	17			0.001	0.042	0	4			0.042	0.042
Dichlorobenzene, 1,3-	0	17			0.002	0.042	0	4			0.042	0.042
Dichlorobenzene, 1,4-	0	17			0.001	0.034	0	4			0.034	0.034
Dichlorobenzidine, 3,3'-	0	17			0.2	2	0	4			1.6	1.6
Dichloroethane, 1,1-	0	17			0.002	0.49	0	4			0.49	0.49
Dichloroethane, 1,2-	0	17			0.003	0.32	0	4			0.32	0.32
Dichloroethenes, 1,2- (cis and trans)	0	17			0.002	0.32	0	4			0.32	0.32
Dichloroethylene, 1,1-	0	17			0.017	0.27	0	4			0.27	0.27
Dichlorophenol, 2,4-	0	17			0.065	3	0	4			0.065	0.065
Dichloropropane, 1,2-	0	17			0.002	0.53	0	4			0.53	0.53
Dichloropropane, 1,3-	0	17			0.001	0.2	0	4			0.2	0.2
Dichloropropene, 1,3- trans	0	17			0.005	0.6	0	4			0.6	0.6
Dichloropropylene, 1,3- cis	0	17			0.005	0.6	0	4			0.6	0.6
Dicyclopentadiene	0	12			0.57	0.57	0	4			0.57	0.57
Dieldrin	7	17	0.00297	0.188	0.0016	0.079	2	4	0.0121	0.0196	0.0016	0.079
Diethyl phthalate	0	17			0.24	3	0	4			0.24	0.24
Dimethyl phthalate	0	17			0.063	3	0	4			0.063	0.063
Dimethylbenzene, 1,2- / o-Xylene	0	5			0.005	0.006						
Dimethylbenzene, 1,3- / m-Xylene	0	17			0.005	0.23	0	4			0.23	0.23
Dimethylphenol, 2,4-	0	17			0.3	3	0	4			3	3
Dinitroaniline, 2,6-	0	12			0.57	0.57	0	4			0.57	0.57
Dinitroaniline, 3,5-	0	12			1.6	1.6	0	4			1.6	1.6
Dinitrophenol, 2,4-	0	17			1.7	20	0	4			4.7	4.7
Dinitrotoluene, 2,4-	0	17			0.39	3.9	0	4			1.4	1.4
Dinitrotoluene, 2,6-	0	17			0.32	5.3	0	4			0.32	0.32
Diphenylhydrazine, 1,2-	0	12			0.52	0.52	0	4			0.52	0.52
Dithiane	0	17			0.065	2.4	0	4			0.065	0.065
Endosulfan sulfate	0	17			0.0005	2	0	4			0.0005	0.005

TABLE N-3 SUMMARY OF CHEMCIAL DATA FOR PARK AND YACHT CLUB SOIL LOCATIONS

	PARK						YACHT CLUB					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Endrin	1	17	0.0986	0.0986	0.0065	1.3	0	4			0.0065	0.065
Endrin aldehyde	0	12			1.8	1.8	0	4			1.8	1.8
Endrin ketone	0	17			0.0005	2	0	4			0.0005	0.005
Ethylbenzene	0	17			0.003	0.19	0	4			0.19	0.19
Fluoranthene	10	17	0.393	54.1	0.032	5.2	3	4	0.877	6.2	0.032	0.032
Fluorene	6	17	0.159	1.05	0.065	3	1	4	0.196	0.196	0.065	0.065
Gamma-Chlordane	1	5	0.032	0.032	0.004	0.004						
Gamma-Hexachlorocyclohexane	3	17	0.00381	0.255	0.001	0.1	1	4	0.00691	0.00691	0.001	0.1
Heptachlor	1	17	0.0683	0.0683	0.001	0.24	0	4			0.0022	0.24
Heptachlor epoxide	3	17	0.0023	0.0298	0.0013	0.013	2	4	0.00343	0.0319	0.0013	0.0013
Hexachlorobenzene	0	17			0.08	2.6	0	4			0.08	0.08
Hexachlorobutadiene	0	17			0.42	4.2	0	4			0.97	0.97
Hexachlorocyclopentadiene	0	17			0.3	3	0	4			0.52	0.52
Hexachloroethane	0	17			0.4	4	0	4			1.8	1.8
Hexanone, 2-	0	17			0.01	1	0	4			1	1
Indeno (1,2,3-cd) pyrene	3	17	4.51	10.4	0.21	2.4	0	4			2.4	2.4
Iron	18	18	19100	37100			4	4	14900	45200		
Isodrin	2	17	0.067	0.152	0.003	0.03	0	4			0.003	0.03
Isophorone	0	17			0.3	3	0	4			0.39	0.39
Lead	13	17	16	406	7.44	54.7	3	4	29.1	1330	7.44	7.44
Magnesium	18	18	2130	8340			4	4	2900	7600		
Malathion	0	17			0.18	4.8	0	4			0.18	0.18
Manganese	18	18	204	1340			4	4	203	521		
Mercury	2	7	0.065	0.101	0.028	0.05	1	2	0.085	0.085	0.05	0.05
Methoxychlor	4	17	0.0509	0.698	0.0359	10	0	4			0.0359	0.26
Methyl-4,6,dinitrophenol, 2-	0	17			0.8	20	0	4			0.8	0.8
Methyl-4-chlorophenol, 3-	0	17			0.3	3	0	4			0.93	0.93
Methylene chloride	0	17			0.005	4.4	0	4			4.4	4.4
Methylisobutyl ketone	0	17			0.01	0.63	0	4			0.63	0.63
Methylnaphthalene, 2-	4	17	0.0641	0.436	0.032	3	1	4	0.794	0.794	0.032	0.032
Methylphenol, 2-	0	17			0.098	3	0	4			0.098	0.098
Methylphenol, 4-	0	17			0.24	3	1	4	1.49	1.49	0.24	0.24
Mirex	0	12			0.14	0.14	0	4			0.14	0.14
Molybdenum	0	1			1.49	1.49						
N-Nitrosodi-N-propylamine	0	12			1.1	1.1	0	4			1.1	1.1
N-Nitrosodimethylamine	0	12			0.46	0.46	0	4			0.46	0.46
N-Nitrosodiphenylamine	0	17			0.29	3	0	4			0.29	0.29
Naphthalene	0	17			0.42	4.2	1	4	2.1	2.1	0.74	0.74
Nickel	18	18	6.43	41			4	4	10.4	22.4		
Nitroaniline, 2-	0	17			1.7	20	0	4			3.1	3.1
Nitroaniline, 3-	0	17			1.7	20	0	4			3	3
Nitroaniline, 4-	0	17			1.7	20	0	4			3.1	3.1
Nitrobenzene	0	17			0.3	3	0	4			1.8	1.8
Nitrophenol, 2-	0	17			0.3	3	0	4			1.1	1.1
Nitrophenol, 4-	0	17			1.7	20	0	4			3.3	3.3
Nitrosodi-N-propylamine	0	5			0.36	3.6						
Nitrotoluene, 3-	0	12			0.34	0.34	0	4			0.34	0.34
Oxathiane, 1,4-	0	17			0.075	2.5	0	4			0.075	0.075
PCB 1016	0	17			0.07	0.32	0	4			0.1	0.32
PCB 1221	0	12			0.1	1	0	4			0.1	1

TABLE N-3 SUMMARY OF CHEMCIAL DATA FOR PARK AND YACHT CLUB SOIL LOCATIONS

	PARK						YACHT CLUB					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
PCB 1232	0	12			0.1	1	0	4			0.1	1
PCB 1242	0	12			0.1	1	0	4			0.1	1
PCB 1248	0	12			0.1	1	0	4			0.1	1
PCB 1254	0	12			0.0479	0.479	0	4			0.0479	0.479
PCB 1260	1	17	0.197	0.197	0.0479	0.479	0	4			0.0479	0.479
PCB 1262	0	12			6.3	6.3	0	4			6.3	6.3
Parathion	0	17			0.46	4.6	0	4			1.7	1.7
Pentachlorophenol	0	17			0.76	20	0	4			0.76	0.76
Phenanthrene	9	17	0.15	16.8	0.032	4.1	3	4	1.04	12	0.032	0.032
Phenol	0	17			0.052	3	0	4			0.052	0.052
Polynuclear aromatic hydrocarbon	2	2	0.174	5.7125								
Potassium	18	18	566	4910			4	4	959	3680		
Pyrene	10	17	0.516	52.6	0.083	4.2	3	4	1.36	6.2	0.083	0.083
Selenium	0	17			4.45	20.7	0	4			20.7	20.7
Silver	0	16			0.034	0.803	0	4			0.803	0.803
Sodium	18	18	105	2540			4	4	212	1490		
Styrene	0	17			0.005	0.6	0	4			0.6	0.6
Supona	0	12			0.92	0.92	0	4			0.92	0.92
Tellurium	0	1			5.48	5.48						
Tetrachloroethane, 1,1,2,2-	0	17			0.002	0.2	0	4			0.2	0.2
Tetrachloroethene	0	17			0.002	0.16	0	4			0.16	0.16
Thallium	0	18			0.2	34.3	0	4			34.3	34.3
Tin	0	5			5.43	5.81						
Toluene	0	17			0.007	0.1	0	4			0.1	0.1
Total organic carbon	1	1	104000	104000								
Toxaphene	0	12			0.226	2.26	0	4			0.226	2.26
Trichlorobenzene, 1,2,3-	0	17			0.032	2.9	0	4			0.032	0.032
Trichlorobenzene, 1,2,4-	0	17			0.22	2.9	0	4			0.22	0.22
Trichloroethane, 1,1,1-	0	17			0.004	0.2	0	4			0.2	0.2
Trichloroethane, 1,1,2-	0	17			0.02	0.33	0	4			0.33	0.33
Trichloroethylene	0	17			0.004	0.23	0	4			0.23	0.23
Trichlorophenol, 2,4,5-	0	17			0.49	20	0	4			0.49	0.49
Trichlorophenol, 2,4,6-	0	17			0.061	20	0	4			0.061	0.061
Trifluorochloromethane	0	17			0.005	0.23	0	4			0.23	0.23
Uranium	1	5	0.151	0.151	0.112	0.119						
Vanadium	18	18	27.6	108			4	4	28.2	64.6		
Vapona	0	12			0.068	0.068	0	4			0.068	0.068
Vinyl acetate	0	17			0.01	1	0	4			1	1
Vinyl chloride	0	17			0.01	1.8	0	4			1.8	1.8
Xylenes	0	12			0.78	0.78	0	4			0.78	0.78
Zinc	18	18	48.7	272			4	4	54.3	1390		
pH	1	1	7.13	7.13								

TABLE N-4 SUMMARY OF RADIOLOGICAL DATA FOR PARK AND YACHT CLUB SOIL LOCATIONS

	PARK						YACHT CLUB					
	Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g		Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Alpha gross	12	12	5	25			4	4	9	29		
Beta gross	12	12	4	30			4	4	21	36		
Plutonium 238 isotope												
Plutonium 239 isotope												
Thorium 232												
Uranium 234	12	12	0.4	1.4			4	4	0.5	0.9		
Uranium 235	2	12	0.1	0.1	0.0001	0.0001	1	4	0.1	0.1	0.0001	0.0001
Uranium 238	11	12	0.3	1.3	0.0001	0.0001	4	4	0.4	0.9		

TABLE N-5 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L		Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Acenaphthene	0	10			0.0058	0.0058	0	6			0.0058	0.0058
Acenaphthylene	0	10			0.0051	0.0051	0	6			0.0051	0.0051
Acetone	0	10			0.008	0.008	0	6			0.008	0.008
Acrolein	0	6			0.15	0.15	0	6			0.15	0.15
Acrylonitrile	0	10			0.0084	0.0084	0	6			0.0084	0.0084
Aldrin	0	10			7.4E-06	0.013	0	5			7.4E-06	7.4E-06
Alpha-Endosulfan	0	10			2.5E-06	0.023	0	5			2.5E-06	2.5E-06
Alpha-Hexachlorocyclohexane	0	10			2.5E-06	0.0053	0	5			2.5E-06	2.5E-06
Aluminum	6	10	0.132	0.414	0.112	0.112	5	6	0.16	0.292	0.112	0.112
Aluminum - Filtered	2	10	0.146	0.174	0.112	0.112	3	6	0.118	0.164	0.112	0.112
Anthracene	0	10			0.0052	0.0052	0	6			0.0052	0.0052
Antimony	0	10			0.06	0.06	0	6			0.06	0.06
Antimony - Filtered	0	10			0.06	0.06	0	6			0.06	0.06
Arsenic	0	10			0.00235	0.00235	0	6			0.00235	0.00235
Arsenic - Filtered	0	10			0.00235	0.00235	0	6			0.00235	0.00235
Atrazine	0	9			0.0059	0.0059	0	6			0.0059	0.0059
Barium	10	10	0.0254	0.0355			6	6	0.0258	0.0274		
Barium - Filtered	10	10	0.0211	0.0286			6	6	0.0213	0.11		
Benzene	0	10			0.001	0.001	0	6			0.001	0.001
Benzo (a) anthracene	0	10			0.0098	0.0098	0	6			0.0098	0.0098
Benzo (a) pyrene	0	10			0.014	0.014	0	6			0.014	0.014
Benzo (b) fluoranthene	0	10			0.01	0.01	0	6			0.01	0.01
Benzo (g,h,i) perylene	0	10			0.015	0.015	0	6			0.015	0.015
Benzo (k) fluoranthene	0	10			0.01	0.01	0	6			0.01	0.01
Benzoic acid	0	6			0.0031	0.0031	0	5			0.0031	0.0031
Benzyl alcohol	0	10			0.004	0.004	0	6			0.004	0.004
Beryllium	0	10			0.00112	0.00112	0	6			0.00112	0.00112
Beryllium - Filtered	0	10			0.00112	0.00112	1	6	0.00123	0.00123	0.00112	0.00112
Beta-Endosulfan	0	10			7.7E-06	0.042	0	5			7.7E-06	7.7E-06
Beta-Hexachlorocyclohexane	0	10			9.9E-06	0.017	0	5			9.9E-06	9.9E-06
Bichlorobenzene - nonspecific	0	10			0.002	0.002	0	6			0.002	0.002
Bis (2-chloroethyl) ether	0	10			0.00068	0.00068	0	6			0.00068	0.00068
Bis (2-chloroethyoxy) methane	0	10			0.0068	0.0068	0	6			0.0068	0.0068
Bis (2-chloroisopropyl) ether	0	10			0.005	0.005	0	6			0.005	0.005
Bis (2-ethylhexyl) phthalate	1	10	0.0337	0.0337	0.0077	0.0077	1	6	0.0616	0.0616	0.0077	0.0077
Bromacil	0	9			0.0029	0.0029	0	6			0.0029	0.0029
Bromodichloromethane	0	10			0.001	0.001	0	6			0.001	0.001
Bromofluorobenzene, 4-	0	6			0.005	0.005	0	6			0.005	0.005
Bromoform	0	10			0.011	0.011	0	6			0.011	0.011
Bromomethane	0	10			0.014	0.014	0	6			0.014	0.014
Bromophenylphenyl ether, 4-	0	10			0.022	0.022	0	6			0.022	0.022
Butanone, 2-	0	10			0.01	0.01	0	6			0.01	0.01
Butylbenzyl phthalate	0	10			0.028	0.028	0	6			0.028	0.028
Cadmium	0	10			0.00678	0.00678	0	6			0.00678	0.00678
Cadmium - Filtered	0	10			0.00678	0.00678	0	6			0.00678	0.00678
Calcium	10	10	12.8	18.2			6	6	12.6	13		
Calcium - Filtered	10	10	13.1	18			6	6	12.5	12.9		
Carbon disulfide	0	10			0.005	0.005	0	6			0.005	0.005
Carbon tetrachloride	0	10			0.001	0.001	0	6			0.001	0.001
Chlordane	0	10			3.12E-05	0.037	0	5			3.12E-05	3.12E-05

TABLE N-5 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L		Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Chloroaniline, 4-	0	6			0.001	0.001	0	5			0.001	0.001
Chlorobenzene	0	10			0.001	0.001	0	6			0.001	0.001
Chloroethane	0	10			0.008	0.008	0	6			0.008	0.008
Chloroethylvinyl ether, 2-	0	10			0.0035	0.0035	0	6			0.0035	0.0035
Chloroform	0	10			0.001	0.001	0	6			0.001	0.001
Chloromethane	0	10			0.0012	0.0012	0	6			0.0012	0.0012
Chloronaphthalene, 2-	0	10			0.0026	0.0026	0	6			0.0026	0.0026
Chlorophenol, 2-	0	10			0.0028	0.0028	0	6			0.0028	0.0028
Chlorophenylmethyl sulfide, p-	0	10			0.01	0.01	0	6			0.01	0.01
Chlorophenylmethyl sulfone, p-	0	10			0.0053	0.0053	0	6			0.0053	0.0053
Chlorophenylmethyl sulfoxide, p-	0	10			0.015	0.015	0	6			0.015	0.015
Chlorophenylphenyl ether, 4-	0	10			0.023	0.023	0	6			0.023	0.023
Chromium	1	10	0.0192	0.0192	0.0168	0.0168	0	6			0.0168	0.0168
Chromium - Filtered	0	10			0.0168	0.0168	0	6			0.0168	0.0168
Chrysene	0	10			0.0074	0.0074	0	6			0.0074	0.0074
Cobalt	0	10			0.025	0.025	0	6			0.025	0.025
Cobalt - Filtered	0	10			0.025	0.025	0	6			0.025	0.025
Copper	0	10			0.0188	0.0188	1	6	0.0196	0.0196	0.0188	0.0188
Copper - Filtered	0	10			0.0188	0.0188	1	6	0.0198	0.0198	0.0188	0.0188
Cyanide	0	10			0.005	0.005	0	6			0.005	0.005
DDD	0	10			8.1E-06	0.018	0	5			8.1E-06	8.1E-06
DDE	0	10			3.9E-06	0.014	0	5			3.9E-06	3.9E-06
DDT	0	10			2.5E-06	0.018	0	5			2.5E-06	2.5E-06
Delta-Hexachlorocyclohexane	0	10			3.4E-06	0.003	0	5			3.4E-06	3.4E-06
Di-N-butyl phthalate	0	10			0.033	0.033	0	6			0.033	0.033
Di-N-octyl phthalate	0	10			0.0015	0.0015	0	6			0.0015	0.0015
Dibenz (a,h) anthracene	0	10			0.012	0.012	0	6			0.012	0.012
Dibenzofuran	0	10			0.0051	0.0051	0	6			0.0051	0.0051
Dibromochloromethane	0	10			0.001	0.001	0	6			0.001	0.001
Dibromochloropropane	0	10			0.012	0.012	0	6			0.012	0.012
Dichlorobenzene, 1,2-	0	10			0.0012	0.0012	0	6			0.0012	0.0012
Dichlorobenzene, 1,3-	0	10			0.001	0.001	0	6			0.001	0.001
Dichlorobenzene, 1,4-	0	10			0.0015	0.0015	0	6			0.0015	0.0015
Dichlorobenzidine, 3,3'-	0	10			0.005	0.005	0	6			0.005	0.005
Dichloroethane, 1,1-	0	10			0.001	0.001	0	6			0.001	0.001
Dichloroethane, 1,2-	0	10			0.001	0.001	0	6			0.001	0.001
Dichloroethenes, 1,2- (cis and t	0	10			0.005	0.005	0	6			0.005	0.005
Dichloroethylene, 1,1-	0	10			0.001	0.001	0	6			0.001	0.001
Dichlorophenol, 2,4-	0	10			0.0084	0.0084	0	6			0.0084	0.0084
Dichloropropane, 1,2-	0	10			0.001	0.001	0	6			0.001	0.001
Dichloropropane, 1,3-	0	10			0.0048	0.0048	0	6			0.0048	0.0048
Dichloropropene, 1,3- trans	0	10			0.005	0.005	0	6			0.005	0.005
Dichloropropylene, 1,3- cis	0	10			0.005	0.005	0	6			0.005	0.005
Dicyclopentadiene	0	10			0.0055	0.0055	0	6			0.0055	0.0055
Dieldrin	0	10			7.4E-06	0.026	0	5			7.4E-06	7.4E-06
Diethyl phthalate	0	10			0.0059	0.0059	0	6			0.0059	0.0059
Diisopropylmethyl phosphonate	0	9			0.021	0.021	0	6			0.021	0.021
Dimethyl phthalate	0	10			0.0022	0.0022	0	6			0.0022	0.0022
Dimethylbenzene, 1,3- / m-Xylene	4	10	0.00131	0.00293	0.001	0.001	0	6			0.001	0.001
Dimethylmethyl phosphate	0	9			0.13	0.13	0	6			0.13	0.13

TABLE N-5 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L		Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Dimethylphenol, 2,4-	0	10			0.0044	0.0044	0	6			0.0044	0.0044
Dinitroaniline, 2,6-	0	10			0.0088	0.0088	0	6			0.0088	0.0088
Dinitroaniline, 3,5-	0	10			0.021	0.021	0	6			0.021	0.021
Dinitrophenol, 2,4-	0	10			0.176	0.176	0	6			0.176	0.176
Dinitrotoluene, 2,4-	0	10			0.0058	0.0058	0	6			0.0058	0.0058
Dinitrotoluene, 2,6-	0	10			0.0067	0.0067	0	6			0.0067	0.0067
Diphenylhydrazine, 1,2-	0	10			0.013	0.013	0	6			0.013	0.013
Dithiane	0	9			0.0033	0.0033	0	6			0.0033	0.0033
Endosulfan sulfate	0	10			2.5E-06	0.05	0	5			2.5E-06	2.5E-06
Endrin	0	10			1.76E-05	0.018	0	5			1.76E-05	1.76E-05
Endrin aldehyde	0	9			0.005	0.005	0	6			0.005	0.005
Endrin ketone	0	8			2.5E-06	2.5E-06	0	5			2.5E-06	2.5E-06
Ethylbenzene	1	10	0.0012	0.0012	0.001	0.001	0	6			0.001	0.001
Fluoranthene	0	10			0.024	0.024	0	6			0.024	0.024
Fluorene	0	10			0.0092	0.0092	0	6			0.0092	0.0092
Gamma-Hexachlorocyclohexane	2	10	3.21E-06	3.66E-06	2.5E-06	0.0072	2	5	3.33E-06	3.41E-06	2.5E-06	2.5E-06
Heptachlor	0	10			2.5E-06	0.038	0	5			2.5E-06	2.5E-06
Heptachlor epoxide	0	10			6.3E-06	0.028	0	5			6.3E-06	6.3E-06
Hexachlorobenzene	0	10			0.012	0.012	0	6			0.012	0.012
Hexachlorobutadiene	0	10			0.0087	0.0087	0	6			0.0087	0.0087
Hexachlorocyclopentadiene	0	10			0.054	0.054	0	6			0.054	0.054
Hexachloroethane	0	10			0.0083	0.0083	0	6			0.0083	0.0083
Hexanone, 2-	0	10			0.01	0.01	0	6			0.01	0.01
Hexavalent chromium	1	2	0.0042	0.0042	0.0025	0.0025	0	0				
Indeno (1,2,3-cd) pyrene	0	10			0.021	0.021	0	6			0.021	0.021
Iron	10	10	0.288	0.872			6	6	0.439	0.568		
Iron - Filtered	9	10	0.134	0.372	0.0775	0.0775	6	6	0.161	0.328		
Isodrin	3	10	3.71E-06	4.75E-06	2.5E-06	0.0078	3	5	3.74E-06	6.07E-06	2.5E-06	2.5E-06
Isophorone	0	10			0.0024	0.0024	0	6			0.0024	0.0024
Lead	0	10			0.0434	0.0434	0	6			0.0434	0.0434
Lead - Filtered	0	10			0.0434	0.0434	0	6			0.0434	0.0434
Magnesium	10	10	2.9	3.95			6	6	2.82	2.99		
Magnesium - Filtered	9	10	0.743	3.87	0.135	0.135	6	6	2.8	2.94		
Malathion	0	9			0.021	0.021	0	6			0.021	0.021
Manganese	9	10	0.0533	0.0883	0.00967	0.00967	6	6	0.0333	0.0544		
Manganese - Filtered	8	10	0.0278	0.0636	0.00967	0.00967	6	6	0.0388	0.046		
Mercury	0	10			0.0001	0.0001	0	6			0.0001	0.0001
Mercury - Filtered	0	10			0.0001	0.0001	0	6			0.0001	0.0001
Methoxychlor	0	10			7.5E-05	0.011	0	5			7.5E-05	7.5E-05
Methyl-4,6,dinitrophenol, 2-	0	6			0.05	0.05	0	5			0.05	0.05
Methyl-4-chlorophenol, 3-	0	10			0.0085	0.0085	0	6			0.0085	0.0085
Methylene chloride	0	10			0.001	0.001	1	6	0.0333	0.0333	0.001	0.001
Methylisobutyl ketone	0	10			0.0014	0.0014	0	6			0.0014	0.0014
Methylnaphthalene, 2-	0	10			0.0013	0.0013	0	6			0.0013	0.0013
Methylphenol, 2-	0	10			0.0036	0.0036	0	6			0.0036	0.0036
Methylphenol, 4-	0	10			0.0028	0.0028	0	6			0.0028	0.0028
Mirex	0	9			0.024	0.024	0	6			0.024	0.024
N-Nitrosodi-N-propylamine	0	10			0.0068	0.0068	0	6			0.0068	0.0068
N-Nitrosodimethylamine	0	10			0.0097	0.0097	0	6			0.0097	0.0097
N-Nitrosodiphenylamine	0	10			0.0037	0.0037	0	6			0.0037	0.0037

TABLE N-5 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L		Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Naphthalene	0	10			0.0005	0.0005	0	6			0.0005	0.0005
Nickel	0	10			0.0321	0.0321	0	6			0.0321	0.0321
Nickel - Filtered	0	10			0.0321	0.0321	0	6			0.0321	0.0321
Nitroaniline, 2-	0	6			0.031	0.031	0	5			0.031	0.031
Nitroaniline, 3-	0	10			0.015	0.015	0	6			0.015	0.015
Nitroaniline, 4-	0	6			0.031	0.031	0	5			0.031	0.031
Nitrobenzene	0	10			0.0037	0.0037	0	6			0.0037	0.0037
Nitrophenol, 2-	0	10			0.0082	0.0082	0	6			0.0082	0.0082
Nitrophenol, 4-	0	10			0.096	0.096	0	6			0.096	0.096
Nitrotoluene, 3-	0	10			0.0029	0.0029	0	6			0.0029	0.0029
Oxathiane, 1,4-	0	9			0.027	0.027	0	6			0.027	0.027
PCB 1016	0	8			0.000385	0.000385	0	5			0.000385	0.000385
PCB 1221	0	8			0.000385	0.000385	0	5			0.000385	0.000385
PCB 1232	0	8			0.000385	0.000385	0	5			0.000385	0.000385
PCB 1242	0	8			0.000385	0.000385	0	5			0.000385	0.000385
PCB 1248	0	8			0.000385	0.000385	0	5			0.000385	0.000385
PCB 1254	0	8			0.000176	0.000176	0	5			0.000176	0.000176
PCB 1260	0	8			0.000176	0.000176	0	5			0.000176	0.000176
Parathion	0	9			0.037	0.037	0	6			0.037	0.037
Pentachlorophenol	0	10			0.0091	0.0091	0	6			0.0091	0.0091
Phenanthrene	0	10			0.0099	0.0099	0	6			0.0099	0.0099
Phenol	0	10			0.0022	0.0022	0	6			0.0022	0.0022
Potassium	10	10	2.15	3.72			6	6	2.04	2.81		
Potassium - Filtered	10	10	2.84	4.31			6	6	2.18	3.74		
Pyrene	0	10			0.017	0.017	0	6			0.017	0.017
Selenium	0	10			0.0971	0.0971	0	6			0.0971	0.0971
Selenium - Filtered	0	10			0.0971	0.0971	0	6			0.0971	0.0971
Silver	0	10			0.01	0.01	0	6			0.01	0.01
Silver - Filtered	0	10			0.01	0.01	0	6			0.01	0.01
Sodium	10	10	21.1	31.1			6	6	20	21.1		
Sodium - Filtered	10	10	23.5	230			6	6	20.3	21.6		
Styrene	0	10			0.005	0.005	0	6			0.005	0.005
Supona	0	9			0.019	0.019	0	6			0.019	0.019
Tetrachloroethane, 1,1,2,2-	0	10			0.0015	0.0015	0	6			0.0015	0.0015
Tetrachloroethene	0	10			0.001	0.001	0	6			0.001	0.001
Thallium	0	10			0.125	0.125	0	6			0.125	0.125
Thallium - Filtered	0	10			0.125	0.125	0	6			0.125	0.125
Toluene	4	10	0.0019	0.0043	0.001	0.001	0	6			0.001	0.001
Toxaphene	0	8			0.00164	0.00164	0	5			0.00164	0.00164
Trichlorobenzene, 1,2,3-	0	10			0.0058	0.0058	0	6			0.0058	0.0058
Trichlorobenzene, 1,2,4-	0	10			0.0024	0.0024	0	6			0.0024	0.0024
Trichloroethane, 1,1,1-	0	10			0.001	0.001	0	6			0.001	0.001
Trichloroethane, 1,1,2-	0	10			0.001	0.001	0	6			0.001	0.001
Trichloroethylene	8	10	0.0022	0.0027	0.001	0.001	0	6			0.001	0.001
Trichlorophenol, 2,3,6-	0	10			0.0017	0.0017	0	6			0.0017	0.0017
Trichlorophenol, 2,4,5-	0	10			0.0028	0.0028	0	6			0.0028	0.0028
Trichlorophenol, 2,4,6-	0	10			0.0036	0.0036	0	6			0.0036	0.0036
Trifluorochloromethane	0	10			0.001	0.001	0	6			0.001	0.001
Vanadium	0	10			0.0276	0.0276	0	6			0.0276	0.0276
Vanadium - Filtered	0	10			0.0276	0.0276	0	6			0.0276	0.0276

TABLE N-5 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L		Freq. of Detection		Range of Detected Values, mg/L		Range of Detection Limits, mg/L	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Vapona	0	9			0.0085	0.0085	0	6			0.0085	0.0085
Vinyl acetate	0	10			0.01	0.01	0	6			0.01	0.01
Vinyl chloride	0	10			0.012	0.012	0	6			0.012	0.012
Xylenes	2	10	0.00218	0.00287	0.002	0.002	0	6			0.002	0.002
Zinc	4	10	0.0191	0.0438	0.018	0.018	3	6	0.0232	0.0491	0.018	0.018
Zinc - Filtered	3	10	0.0261	0.028	0.018	0.018	5	6	0.0246	0.0618	0.018	0.018

TABLE N-6 SUMMARY OF RADIOLOGICAL DATA FOR SITE-RELATED SURFACE WATER AND BACKGROUND SURFACE WATER LOCATIONS

	SITE-RELATED SURFACE WATER SAMPLES						BACKGROUND SURFACE WATER SAMPLES					
	Freq. of Detection		Range of Detected Values, pCi/L		Range of Detection Limits, pCi/L		Freq. of Detection		Range of Detected Values, pCi/L		Range of Detection Limits, pCi/L	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Alpha gross	2	9	1	2	0.0001	0.0001	3	5	1	2	0.0001	0.0001
Beta gross	9	9	1	10			5	5	1	5		
Cesium 137	--(a)	--					--	--				
Plutonium 238 isotope	--	--					--	--				
Plutonium 239 isotope	--	--					--	--				
Thorium 232	--	--					--	--				
Uranium 234	8	9	0.1	0.9	0.0001	0.0001	4	5	0.1	0.1	0.0001	0.0001
Uranium 235	0	9			0.0001	0.0001	0	5			0.0001	0.0001
Uranium 238	7	9	0.1	0.5	0.0001	0.0001	2	5	0.1	0.1	0.0001	0.0001

(a) Not analyzed for in this medium.

TABLE N-7 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SEDIMENT AND BACKGROUND SEDIMENT LOCATIONS

	SITE-RELATED SEDIMENT SAMPLES						BACKGROUND SEDIMENT SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Acenaphthene	14	20	0.157	3.95	0.041	0.041	1	7	0.454	0.454	0.041	0.041
Acenaphthylene	16	20	0.408	8.07	0.033	0.033	5	7	0.32	1.6	0.033	0.033
Acetone	0	20			3.3	3.3	0	7			3.3	3.3
Acrolein	0	20			15	15	0	7			15	15
Acrylonitrile	0	20			2	2	0	7			2	2
Aldrin	10	19	0.00735	0.2	0.0014	0.0014	0	6			0.0014	0.0014
Alpha-Endosulfan	9	19	0.0089	0.11	0.001	0.001	1	6	0.094	0.094	0.001	0.001
Alpha-Hexachlorocyclohexane	0	19			0.0028	0.0028	0	6			0.0028	0.0028
Aluminum	20	20	4180	26900			7	7	8300	25200		
Anthracene	5	20	4.35	9.07	0.71	0.71	0	7			0.71	0.71
Antimony	0	20			19.6	19.6	0	7			19.6	19.6
Arsenic	3	20	5.86	11.2	2.5	2.5	2	7	5.51	14.8	2.5	2.5
Atrazine	0	20			0.065	0.065	0	7			0.065	0.065
Barium	20	20	34.2	418			7	7	78.2	296		
Benzene	0	20			0.1	0.1	0	7			0.1	0.1
Benzo (a) anthracene	17	20	1.28	23.2	0.041	0.041	4	7	2.54	9.96	0.041	0.041
Benzo (a) pyrene	7	20	8.77	28.8	1.2	1.2	2	7	9.09	17.3	1.2	1.2
Benzo (b) fluoranthene	16	20	1.56	25.1	0.31	0.31	4	7	3.06	11.7	0.31	0.31
Benzo (g,h,i) perylene	10	20	1.34	23.1	0.18	0.18	1	7	6.08	6.08	0.18	0.18
Benzo (k) fluoranthene	16	20	1.42	14.7	0.13	0.13	3	7	2.54	3.26	0.13	0.13
Benzoic acid	0	20			3.1	3.1	0	7			3.1	3.1
Benzyl alcohol	0	20			0.032	0.032	0	7			0.032	0.032
Beryllium	2	20	0.526	1.62	0.427	0.427	1	7	1.23	1.23	0.427	0.427
Beta-Endosulfan	9	19	0.00843	0.0192	0.0007	0.0007	0	6			0.0007	0.0007
Beta-Hexachlorocyclohexane	0	19			0.0077	0.0077	0	6			0.0077	0.0077
Bichlorobenzene - nonspecific	0	20			0.2	0.2	0	7			0.2	0.2
Bis (2-chloroethyl) ether	0	20			0.36	0.36	0	7			0.36	0.36
Bis (2-chloroethyoxy) methane	0	20			0.19	0.19	0	7			0.19	0.19
Bis (2-chloroisopropyl) ether	0	20			0.44	0.44	0	7			0.44	0.44
Bis (2-ethylhexyl) phthalate	10	20	6.09	48.2	0.48	0.48	4	7	5.91	20.4	0.48	0.48
Bromodichloromethane	0	20			0.2	0.2	0	7			0.2	0.2
Bromofluorobenzene, 4-	0	20			0.6	0.6	0	7			0.6	0.6
Bromoform	0	20			0.2	0.2	0	7			0.2	0.2
Bromomethane	0	20			0.26	0.26	0	7			0.26	0.26
Bromophenylphenyl ether, 4-	0	20			0.041	0.041	0	7			0.041	0.041
Butanone, 2-	0	20			4.3	4.3	0	7			4.3	4.3
Butylbenzyl phthalate	0	20			1.8	1.8	0	7			1.8	1.8
Cadmium	12	20	2.45	25.1	1.2	1.2	5	7	4.06	13.1	1.2	1.2
Calcium	20	20	1730	14100			7	7	4890	11400		
Carbon disulfide	0	20			0.6	0.6	0	7			0.6	0.6
Carbon tetrachloride	0	20			0.31	0.31	0	7			0.31	0.31
Chlordane	0	19			0.0684	0.0684	0	6			0.0684	0.0684
Chloroaniline, 4-	0	20			0.63	0.63	0	7			0.63	0.63
Chlorobenzene	0	20			0.1	0.1	0	7			0.1	0.1
Chloroethane	0	20			0.64	0.64	0	7			0.64	0.64
Chloroethylvinyl ether, 2-	0	20			0.5	0.5	0	7			0.5	0.5
Chloroform	0	20			0.24	0.24	0	7			0.24	0.24
Chloromethane	0	20			0.96	0.96	0	7			0.96	0.96
Chloronaphthalene, 2-	0	20			0.24	0.24	0	7			0.24	0.24
Chlorophenol, 2-	0	20			0.055	0.055	0	7			0.055	0.055

TABLE N-7 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SEDIMENT AND BACKGROUND SEDIMENT LOCATIONS

	SITE-RELATED SEDIMENT SAMPLES						BACKGROUND SEDIMENT SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Chlorophenylmethyl sulfide, p-	0	20			0.097	0.097	0	7			0.097	0.097
Chlorophenylmethyl sulfone, p-	0	20			0.066	0.066	0	7			0.066	0.066
Chlorophenylmethyl sulfoxide, p-	0	20			0.32	0.32	0	7			0.32	0.32
Chlorophenylphenyl ether, 4-	0	20			0.17	0.17	0	7			0.17	0.17
Chromium	20	20	19.2	159			7	7	43	122		
Chrysene	14	20	0.0558	22.1	0.032	0.032	3	7	2.13	3.01	0.032	0.032
Cobalt	16	20	3.36	27	2.5	2.5	6	7	11	22.9	2.5	2.5
Copper	20	20	8.38	1010			7	7	12.7	280		
Cyanide	4	20	0.493	4.35	0.25	0.25	0	7			0.25	0.25
DDD	17	19	0.01711	0.62	0.0027	0.0027	4	6	0.073	0.25	0.0027	0.0027
DDE	17	19	0.0112	0.38	0.0027	0.0027	4	6	0.06	0.18	0.0027	0.0027
DDT	18	19	0.019	0.7	0.0035	0.0035	2	6	0.15	0.31	0.0035	0.0035
Delta-Hexachlorocyclohexane	1	19	0.0433	0.0433	0.0085	0.0085	0	6			0.0085	0.0085
Di-N-butyl phthalate	2	20	3.06	8.52	1.3	1.3	1	7	17.7	17.7	1.3	1.3
Di-N-octyl phthalate	0	20			0.23	0.23	0	7			0.23	0.23
Dibenz (a,h) anthracene	3	20	1.6	4.29	0.31	0.31	0	7			0.31	0.31
Dibenzofuran	2	20	0.787	1.46	0.038	0.038	0	7			0.038	0.038
Dibromochloromethane	0	20			0.25	0.25	0	7			0.25	0.25
Dibromochloropropane	0	20			0.071	0.071	0	7			0.071	0.071
Dichlorobenzene, 1,2-	1	20	0.821	0.821	0.042	0.042	0	7			0.042	0.042
Dichlorobenzene, 1,3-	0	20			0.042	0.042	0	7			0.042	0.042
Dichlorobenzene, 1,4-	0	20			0.034	0.034	0	7			0.034	0.034
Dichlorobenzidine, 3,3'-	0	20			1.6	1.6	0	7			1.6	1.6
Dichloroethane, 1,1-	0	20			0.49	0.49	0	7			0.49	0.49
Dichloroethane, 1,2-	0	20			0.32	0.32	0	7			0.32	0.32
Dichloroethenes, 1,2- (cis and t	0	20			0.32	0.32	0	7			0.32	0.32
Dichloroethylene, 1,1-	0	20			0.27	0.27	0	7			0.27	0.27
Dichlorophenol, 2,4-	0	20			0.065	0.065	0	7			0.065	0.065
Dichloropropane, 1,2-	0	20			0.53	0.53	0	7			0.53	0.53
Dichloropropane, 1,3-	0	20			0.2	0.2	0	7			0.2	0.2
Dichloropropene, 1,3- trans	0	20			0.6	0.6	0	7			0.6	0.6
Dichloropropylene, 1,3- cis	0	20			0.6	0.6	0	7			0.6	0.6
Dicyclopentadiene	0	20			0.57	0.57	0	7			0.57	0.57
Dieldrin	13	19	0.02457	0.48	0.0016	0.0016	2	6	0.094	1.9	0.0016	0.0016
Diethyl phthalate	0	20			0.24	0.24	0	7			0.24	0.24
Dimethyl phthalate	0	20			0.063	0.063	0	7			0.063	0.063
Dimethylbenzene, 1,3- / m-Xylene	0	20			0.23	0.23	0	7			0.23	0.23
Dimethylphenol, 2,4-	0	20			3	3	0	7			3	3
Dinitroaniline, 2,6-	0	20			0.57	0.57	0	7			0.57	0.57
Dinitroaniline. 3.5-	0	20			1.6	1.6	0	7			1.6	1.6
Dinitrophenol, 2,4-	0	20			4.7	4.7	0	7			4.7	4.7
Dinitrotoluene, 2,4-	0	20			1.4	1.4	0	7			1.4	1.4
Dinitrotoluene, 2,6-	0	20			0.32	0.32	0	7			0.32	0.32
Diphenylhydrazine, 1,2-	0	20			0.52	0.52	0	7			0.52	0.52
Dithiane	0	20			0.065	0.065	0	7			0.065	0.065
Endosulfan sulfate	0	19			0.0005	0.24	0	6			0.0005	0.016
Endrin	5	19	0.0266	0.0538	0.0065	0.0065	0	6			0.0065	0.0065
Endrin aldehyde	0	20			1.8	1.8	0	7			1.8	1.8
Endrin ketone	0	19			0.0005	0.00269	0	6			0.0005	0.0005
Ethylbenzene	0	20			0.19	0.19	0	7			0.19	0.19

TABLE N-7 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SEDIMENT AND BACKGROUND SEDIMENT LOCATIONS

	SITE-RELATED SEDIMENT SAMPLES						BACKGROUND SEDIMENT SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
Fluoranthene	19	20	0.0876	30.7	0.032	0.032	7	7	0.158	13		
Fluorene	16	20	0.294	4.33	0.065	0.065	1	7	0.886	0.886	0.065	0.065
Gamma-Chlordane	0	11			0.004	0.004	0	6			0.004	0.004
Gamma-Hexachlorocyclohexane	1	19	0.00144	0.00144	0.001	0.001	0	6			0.001	0.001
Heptachlor	0	19			0.0022	0.0022	0	6			0.0022	0.0022
Heptachlor epoxide	5	19	0.0189	0.0679	0.0013	0.0013	0	6			0.0013	0.0013
Hexachlorobenzene	0	20			0.08	0.08	0	7			0.08	0.08
Hexachlorobutadiene	0	20			0.97	0.97	0	7			0.97	0.97
Hexachlorocyclopentadiene	0	20			0.52	0.52	0	7			0.52	0.52
Hexachloroethane	0	20			1.8	1.8	0	7			1.8	1.8
Hexanone, 2-	0	20			1	1	0	7			1	1
Hexavalent chromium	0	3			1.81	4.37	0	1			3.46	3.46
Indeno (1,2,3-cd) pyrene	6	20	12	36.7	2.4	2.4	0	7			2.4	2.4
Iron	20	20	7560	47900			7	7	20800	43600		
Isodrin	3	19	0.0122	0.0159	0.003	0.003	0	6			0.003	0.003
Isophorone	0	20			0.39	0.39	0	7			0.39	0.39
Lead	20	20	15.8	1850			7	7	23.1	779		
Magnesium	20	20	1490	8070			7	7	2370	9140		
Malathion	0	20			0.18	0.18	0	7			0.18	0.18
Manganese	20	20	167	972			7	7	368	1050		
Mercury	18	20	0.0551	2.23	0.05	0.05	6	7	0.354	1.65	0.05	0.05
Methoxychlor	0	19			0.0359	0.0359	0	6			0.0359	0.0359
Methyl-4,6,dinitrophenol, 2-	0	20			0.8	0.8	0	7			0.8	0.8
Methyl-4-chlorophenol, 3-	0	20			0.93	0.93	0	7			0.93	0.93
Methylene chloride	0	20			4.4	4.4	0	7			4.4	4.4
Methylisobutyl ketone	0	20			0.63	0.63	0	7			0.63	0.63
Methylnaphthalene, 2-	8	20	0.182	0.823	0.032	0.032	2	7	0.145	0.534	0.032	0.032
Methylphenol, 2-	0	20			0.098	0.098	0	7			0.098	0.098
Methylphenol, 4-	0	20			0.24	0.24	0	7			0.24	0.24
Mirex	0	20			0.14	0.14	0	7			0.14	0.14
N-Nitrosodi-N-propylamine	0	20			1.1	1.1	0	7			1.1	1.1
N-Nitrosodimethylamine	0	20			0.46	0.46	0	7			0.46	0.46
N-Nitrosodiphenylamine	0	20			0.29	0.29	0	7			0.29	0.29
Naphthalene	0	20			0.74	0.74	0	7			0.74	0.74
Nickel	19	20	8.88	55.4	2.74	2.74	7	7	19.8	39		
Nitroaniline, 2-	0	20			3.1	3.1	0	7			3.1	3.1
Nitroaniline, 3-	0	20			3	3	0	7			3	3
Nitroaniline, 4-	0	20			3.1	3.1	0	7			3.1	3.1
Nitrobenzene	0	20			1.8	1.8	0	7			1.8	1.8
Nitrophenol, 2-	0	20			1.1	1.1	0	7			1.1	1.1
Nitrophenol, 4-	0	20			3.3	3.3	0	7			3.3	3.3
Nitrotoluene, 3-	0	20			0.34	0.34	0	7			0.34	0.34
Oxathiane, 1,4-	0	20			0.075	0.075	0	7			0.075	0.075
PCB 1016	0	19			0.1	0.1	0	6			0.1	0.1
PCB 1221	0	19			0.1	0.1	0	6			0.1	0.1
PCB 1232	0	19			0.1	0.1	0	6			0.1	0.1
PCB 1242	0	19			0.1	0.1	0	6			0.1	0.1
PCB 1248	0	19			0.1	0.1	0	6			0.1	0.1
PCB 1254	0	19			0.02	3.8	0	6			0.0479	0.6
PCB 1260	0	19			0.0479	0.0479	0	6			0.0479	0.0479

TABLE N-7 SUMMARY OF CHEMICAL DATA FOR SITE-RELATED SEDIMENT AND BACKGROUND SEDIMENT LOCATIONS

	SITE-RELATED SEDIMENT SAMPLES						BACKGROUND SEDIMENT SAMPLES					
	Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg		Freq. of Detection		Range of Detected Values, mg/kg		Range of Detection Limits, mg/kg	
Chemical Name	Hits	Total	Min	Max	Min	Max	Hits	Total	Min	Max	Min	Max
PCB 1262	0	20			6.3	6.3	0	7			6.3	6.3
Parathion	0	20			1.7	1.7	0	7			1.7	1.7
Pentachlorophenol	0	20			0.76	0.76	0	7			0.76	0.76
Phenanthrene	18	20	0.113	29.9	0.032	0.032	7	7	0.152	8.94		
Phenol	0	20			0.052	0.052	0	7			0.052	0.052
Potassium	20	20	411	5010			7	7	773	4580		
Pyrene	18	20	0.152	58	0.083	0.083	6	7	3.78	21.9	0.083	0.083
Selenium	0	20			20.7	20.7	0	7			20.7	20.7
Silver	8	20	1.14	21.2	0.803	0.803	0	7			0.803	0.803
Sodium	20	20	147	1150			7	7	353	1200		
Styrene	0	20			0.6	0.6	0	7			0.6	0.6
Supona	0	20			0.92	0.92	0	7			0.92	0.92
Tetrachloroethane, 1,1,2,2-	0	20			0.2	0.2	0	7			0.2	0.2
Tetrachloroethene	0	20			0.16	0.16	0	7			0.16	0.16
Thallium	0	20			34.3	34.3	0	7			34.3	34.3
Toluene	0	20			0.1	0.1	0	7			0.1	0.1
Toxaphene	0	19			0.226	0.226	0	6			0.226	0.226
Trichlorobenzene, 1,2,3-	0	20			0.032	0.032	0	7			0.032	0.032
Trichlorobenzene, 1,2,4-	0	20			0.22	0.22	0	7			0.22	0.22
Trichloroethane, 1,1,1-	0	20			0.2	0.2	0	7			0.2	0.2
Trichloroethane, 1,1,2-	0	20			0.33	0.33	0	7			0.33	0.33
Trichloroethylene	0	20			0.23	0.23	0	7			0.23	0.23
Trichlorophenol, 2,3,6-	0	20			0.62	0.62	0	7			0.62	0.62
Trichlorophenol, 2,4,5-	0	20			0.49	0.49	0	7			0.49	0.49
Trichlorophenol, 2,4,6-	0	20			0.061	0.061	0	7			0.061	0.061
Trifluorochloromethane	0	20			0.23	0.23	0	7			0.23	0.23
Vanadium	20	20	14.3	94.9			7	7	34.3	72.4		
Vapona	0	20			0.068	0.068	0	7			0.068	0.068
Vinyl acetate	0	20			1	1	0	7			1	1
Vinyl chloride	0	20			1.8	1.8	0	7			1.8	1.8
Xylenes	0	20			0.78	0.78	0	7			0.78	0.78
Zinc	20	20	34.4	894			7	7	70.2	689		

TABLE N-8 SUMMARY OF RADIOLOGICAL DATA FOR SITE-RELATED SEDIMENT AND BACKGROUND SEDIMENT LOCATIONS

	SITE-RELATED SEDIMENT SAMPLES						BACKGROUND SEDIMENT SAMPLES					
	Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g		Freq. of Detection		Range of Detected Values, pCi/g		Range of Detection Limits, pCi/g	
Chemical Name	Hits	Total	Min.	Max.	Min.	Max.	Hits	Total	Min.	Max.	Min.	Max.
Alpha gross	18	18	11	35			5	5	22	35		
Beta gross	18	18	19	37			5	5	20	63		
Cesium 137	--(a)	--					--	--				
Plutonium 238 isotope	--	--					--	--				
Plutonium 239 isotope	--	--					--	--				
Thorium 232	--	--					--	--				
Uranium 234	18	18	0.5	1.4			5	5	0.8	1.3		
Uranium 235	5	18	0.1	0.2	0.0001	0.0001	2	5	0.1	0.1	0.0001	0.0001
Uranium 238	18	18	0.5	1.5			5	5	0.7	1.2		

(a) Not analyzed for in this medium.

APPENDIX O

EXPOSURE POINT CONCENTRATIONS

O. Exposure Point Concentrations

Part A Exposure Point Concentrations in Garden Vegetables

The concentration of contaminants in garden vegetables grown in contaminated soil may be calculated from the concentration in soil as follows:

$$C_v = C_s \cdot BCF$$

where:

C_v = Concentration of contaminant in vegetables (mg/kg)
C_s = Concentration of contaminant in soil (mg/kg)
BCF = Bioconcentration factor for vegetables (unitless)

The value of BCF is a chemical-specific and plant-specific term. For the purposes of this assessment, plants were divided into three categories: (1) leafy vegetables (lettuce, cabbage, etc.); (2) root vegetables (carrots, radishes, potatoes, etc.); and (3) garden fruits (tomatoes, corn, etc.).

For inorganic ions, BCF values for leafy vegetables and for root vegetables/garden fruits are given in Baes et al. (1984).

For organic chemicals, BCF values for leafy vegetables are calculated from the following equation (Travis and Arms, 1988):

$$\log(BCF_{lv}) = 1.588 - 0.578 \cdot \log(K_{ow})$$

Thus,

$$BCF_{lv} = 10^{(1.588 - 0.578 \cdot \log K_{ow})}$$

For root vegetables and garden fruits, BCF values are derived as follows:

$$BCF_{rv} = BCF_{gf} = \frac{RCF}{K_{oc} \cdot foc}$$

where:

RCF = Root concentration factor (unitless)
K_{oc} = Organic carbon/water partition coefficient (unitless)
foc = Fraction of soil that is organic carbon (unitless)

The value of RCF is given by Briggs et al. (1982) as:

$$\log(\mathrm{RCF}-0.82) = 0.77 \cdot \log(K_{ow}) - 1.52$$

Values of K_{oc} are available in the literature for some chemicals. In the absence of data, the value of K_{oc} can be estimated from the value of K_{ow}, as follows (Lyman et al., 1982):

$$\log(K_{oc}) = 0.544 \cdot \log(K_{ow}) + 1.377$$

Combining these equations yields:

$$BCF_{rv} = BCF_{gf} = \frac{10^{(0.77 \log K_{ow} - 1.52)} + 0.82}{foc \cdot 10^{(0.544 \cdot \log K_{ow} + 1.377)}}$$

The value of foc is site-specific. A default value of 0.02 (2%) was assumed to be representative for soils within the areas of concern at MTL.

Adjustment for Wet Weight

The BCF values above are expressed in terms of the dry weight of the vegetable, while human intake is usually described in terms of wet weight. Therefore, each BCF term was corrected by multiplying by the dry weight/wet weight ratio for each vegetable type. Based on data from Baes et al. (1984), these ratios are as follows:

Vegetable Type	Dry Wt./Wet Wt.
Leafy vegetables	0.05
Garden fruits	0.06
Root vegetables	0.12

In order to simplify the overall process of calculating exposure via garden vegetables, the total dose from all three types of vegetable can be calculated as follows:

$$\begin{aligned} DI_v &= DI_{lv} + DI_{rv} + DI_{gf} \\ &= C_{lv} \cdot HIF_{lv} + C_{rv} \cdot HIF_{rv} + C_{gf} \cdot HIF_{gf} \\ HIF_{lv} &= HIF_v \cdot f_{lv} \\ HIF_{rv} &= HIF_v \cdot f_{rv} \\ HIF_{gf} &= HIF_v \cdot f_{gf} \end{aligned}$$

where:

HIF_v = Total intake of garden vegetables (kg/kg/day).
f_{lv} = Fraction of total garden vegetable intake comprised of leafy vegetables (unitless).

f_{rv} = Fraction of total garden vegetable intake comprised of root vegetables (unitless).
f_{gf} = Fraction of total garden vegetable intake comprised of garden fruit vegetables (unitless).

Based on data on intake of garden vegetables by category (EPA, 1989), values of f for each class can be calculated as follows:

Category	% Total Adult	% Total Child	Average	f
Leafy vegetable	21	10	15	0.15
Root vegetable	32	45	39	0.39
Garden fruit	47	45	46	0.46
Total	100	100	100	1.00

Using these values of f and substituting for C_{lv}, C_{rv} and C_{gf} from the equations described previously yields:

$$= C_s \cdot HIF_v \cdot [(0.15)(BCF_{lv}) + (0.39)(BCF_{rv}) + (0.46)(BCF_{gf})]$$
$$= C_s \cdot HIF_v \cdot BCF_v$$

The term in brackets can then be evaluated for each chemical of potential concern and used to calculate dose from the concentration in surface soil (C_s) and the total daily intake of garden vegetables (HIF_v). Calculations for deriving BCF terms are summarized in Table O-1.

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TABLE O-1 CALCULATION OF BIOCONCENTRATION FACTORS FOR GARDEN VEGETABLES

		CHEM. SPEC DATA INPUT	UPTAKE INTO ROOTS AND FRUITS			UPTAKE INTO LEAFY VEGS.	
CHEMICAL	logKow (a)	Koc	RCF	BCFr	BCFf	BCFl	BCFv
Acenaphthene	3.92	3.2E+03	3.2E+01	6.0E-02	3.0E-02	1.1E-02	3.9E-02
Acenaphthylene	4.07	3.9E+03	4.2E+01	6.4E-02	3.2E-02	8.6E-03	4.1E-02
Acetone	-0.24	1.8E+01	8.4E-01	2.9E-01	1.4E-01	2.7E+00	5.8E-01
Aldrin	3.01	1.0E+03	7.1E+00	4.1E-02	2.1E-02	3.5E-02	3.1E-02
Alpha-Chlordane	5.54	2.5E+04	5.6E+02	1.4E-01	6.8E-02	1.2E-03	8.5E-02
Alpha-Endosulfan	3.55	2.0E+03	1.7E+01	5.1E-02	2.5E-02	1.7E-02	3.4E-02
Anthracene	4.55	7.1E+03	9.7E+01	8.2E-02	4.1E-02	4.5E-03	5.1E-02
Arsenic (b)				7.2E-04	3.6E-04	2.0E-03	7.5E-04
Barium (b)				1.8E-03	9.0E-04	7.5E-03	2.2E-03
Benzene	2.13	3.4E+02	2.1E+00	3.7E-02	1.9E-02	1.1E-01	4.0E-02
Benzo (a) anthracene	5.66	2.9E+04	6.9E+02	1.4E-01	7.2E-02	1.0E-03	9.0E-02
Benzo (a) pyrene	6.1	5.0E+04	1.5E+03	1.8E-01	9.1E-02	5.8E-04	1.1E-01
Benzo (b) fluoranthene	6.12	5.1E+04	1.6E+03	1.8E-01	9.2E-02	5.6E-04	1.1E-01
Benzo (g,h,i) perylene	7.1	1.7E+05	8.9E+03	3.1E-01	1.5E-01	1.5E-04	1.9E-01
Benzo (k) fluoranthene	6.85	1.3E+05	5.7E+03	2.7E-01	1.3E-01	2.1E-04	1.7E-01
Beryllium (b)				1.8E-04	9.0E-05	5.0E-04	1.9E-04
Beta-Endosulfan	3.55	2.0E+03	1.7E+01	5.1E-02	2.5E-02	1.7E-02	3.4E-02
Bis (2-ethylhexyl) phthalate	9	1.9E+06	2.6E+05	8.2E-01	4.1E-01	1.2E-05	5.1E-01
Boron (b)				2.4E-01	1.2E-01	2.0E-01	1.8E-01
Butanone, 2-	0.29	3.4E+01	8.7E-01	1.5E-01	7.6E-02	1.3E+00	2.9E-01
Cadmium (b)				1.8E-02	9.0E-03	2.8E-02	1.5E-02
Cadmium (water) (b)							NA
Chlordane	5.54	2.5E+04	5.6E+02	1.4E-01	6.8E-02	1.2E-03	8.5E-02
Chromium (b)				5.4E-04	2.7E-04	3.8E-04	3.9E-04
Chrysene	5.66	2.9E+04	6.9E+02	1.4E-01	7.2E-02	1.0E-03	9.0E-02
Cobalt (b)				8.4E-04	4.2E-04	1.0E-03	6.7E-04
Cyanide (b)				NA	NA	NA	NA
DDD	5.8	3.4E+04	8.8E+02	1.6E-01	7.8E-02	8.6E-04	9.7E-02
DDE	5.69	3.0E+04	7.3E+02	1.5E-01	7.4E-02	1.00E-03	9.1E-02
DDT	6.36	6.9E+04	2.4E+03	2.1E-01	1.0E-01	4.1E-04	1.3E-01
Dibenz (a,h) anthracene	6.84	1.3E+05	5.6E+03	2.7E-01	1.3E-01	2.2E-04	1.7E-01
Dieldrin	4.56	7.2E+03	9.9E+01	8.2E-02	4.1E-02	4.5E-03	5.2E-02
Dimethylbenzene	3.2	1.3E+03	9.6E+00	4.4E-02	2.2E-02	2.7E-02	3.1E-02
Endrin	4.56	7.2E+03	9.9E+01	8.2E-02	4.1E-02	4.5E-03	5.2E-02
Fluoranthene	4.95	1.2E+04	2.0E+02	1.0E-01	5.0E-02	2.7E-03	6.3E-02
Fluorene	4.12	4.2E+03	4.6E+01	6.6E-02	3.3E-02	8.0E-03	4.2E-02
Gamma-Chlordane	5.54	2.5E+04	5.6E+02	1.4E-01	6.8E-02	1.2E-03	8.5E-02
Gamma-Hexachlorocyclohexane	4.14	4.3E+03	4.7E+01	6.7E-02	3.3E-02	7.8E-03	4.3E-02
Heptachlor	4.27	5.0E+03	5.9E+01	7.1E-02	3.6E-02	6.6E-03	4.5E-02
Heptachlor epoxide	5.4	2.1E+04	4.4E+02	1.3E-01	6.3E-02	1.5E-03	7.9E-02
Indeno (1,2,3-cd) pyrene	6.58	9.0E+04	3.5E+03	2.3E-01	1.2E-01	3.0E-04	1.4E-01
Lead (b)				1.1E-03	5.4E-04	2.3E-03	1.0E-03
Manganese (b)				6.0E-03	3.0E-03	1.3E-02	5.7E-03
Mercury (b)				2.4E-02	1.2E-02	4.5E-02	2.2E-02
Methylnaphthalene, 2-	4.11	4.1E+03	4.5E+01	6.6E-02	3.3E-02	8.2E-03	4.2E-02
Naphthalene	3.3	1.5E+03	1.1E+01	4.6E-02	2.3E-02	2.4E-02	3.2E-02
Nickel (b)				7.2E-03	3.6E-03	3.0E-03	4.9E-03
Nitrate (b)				3.6E+00	1.8E+00	1.5E+00	2.5E+00
Nitrite, nitrate - nonspecific (b)				3.6E+00	1.8E+00	1.5E+00	2.5E+00
PCB 1260	6.91	1.4E+05	6.3E+03	2.8E-01	1.4E-01	2.0E-04	1.7E-01
Phenanthrene	4.57	7.3E+03	1.0E+02	8.3E-02	4.1E-02	4.4E-03	5.2E-02
Pyrene	4.88	1.1E+04	1.7E+02	9.7E-02	4.8E-02	2.9E-03	6.0E-02
Silver (b)				1.2E-02	6.0E-03	2.0E-02	1.0E-02
Sulfide (b)				1.8E-01	9.0E-02	7.5E-02	1.2E-01
Tetrachloroethene	3.4	1.7E+03	1.3E+01	4.8E-02	2.4E-02	2.1E-02	3.3E-02
Tetrazene	NA	NA	NA	NA	NA	NA	NA
Tin (b)				7.2E-04	3.6E-04	1.5E-03	6.7E-04
Toluene	2.73	7.3E+02	4.6E+00	3.8E-02	1.9E-02	5.1E-02	3.1E-02
Trichloroethene	2.42	4.9E+02	3.0E+00	3.7E-02	1.8E-02	7.7E-02	3.4E-02
Uranium (b)				4.8E-04	2.4E-04	4.3E-04	3.6E-04

TABLE O-1 CALCULATION OF BIOCONCENTRATION FACTORS FOR GARDEN VEGETABLES

		CHEM. SPEC DATA INPUT	UPTAKE INTO ROOTS AND FRUITS			UPTAKE INTO LEAFY VEGS.	
CHEMICAL	logKow (a)	Koc	RCF	BCFr	BCFf	BCFl	BCFv
Vanadium (b)				3.6E-04	1.8E-04	2.8E-04	2.6E-04
Xylenes	3.2	1.3E+03	9.6E+00	4.4E-02	2.2E-02	2.7E-02	3.1E-02

(a) All values from USEPA 1992 unless noted otherwise.
(b) Baes, 1984.

Part B: Exposure Point Concentration Worksheets for Chemical Contaminants

		DATA STATISTICS	DATE: 08/18/93
EXPOSURE POINT:	ON-SITE - ZONE 1		FILENA STTS-2Z1.WQ1
MEDIUM:	SOILS (0-2')		
UNITS:	MG/KG		
U MULTIPLIER:	0.5		

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC	BCv	VEGEPC
1	Acenaphthene	0	4	2.1E-01	ERR	6.7E-02	0.0E+00	3.9E-02	0.0E+00
2	Acenaphthylene	2	4	++	++	++	0.0E+00	4.1E-02	0.0E+00
3	Aldrin	0	6	1.5E-01	ERR	2.5E-02	0.0E+00	3.1E-02	0.0E+00
4	Alpha-Chlordane	1	2	5.0E-01	1.3E-01	3.2E-01	1.3E-01	8.5E-02	1.1E-02
5	Alpha-Endosulfan	0	5	5.0E-02	ERR	1.0E-02	0.0E+00	3.4E-02	0.0E+00
6	Anthracene	0	4	3.6E-01	ERR	3.3E-01	0.0E+00	5.1E-02	0.0E+00
7	Benzene	0	4	5.0E-02	ERR	3.8E-02	0.0E+00	4.0E-02	0.0E+00
8	Benzo (a) anthracene	4	4	6.3E-01	6.3E-01	3.7E-01	3.7E-01	9.0E-02	3.3E-02
9	Benzo (a) pyrene	0	4	6.0E-01	ERR	5.0E-01	0.0E+00	1.1E-01	0.0E+00
10	Benzo (b) fluoranthene	2	4	9.9E-01	9.9E-01	5.0E-01	5.0E-01	1.1E-01	5.7E-02
11	Benzo (g,h,i) perylene	2	4	1.3E+00	1.3E+00	5.0E-01	5.0E-01	1.9E-01	9.4E-02
12	Benzo (k) fluoranthene	2	4	7.7E-01	7.7E-01	4.6E-01	4.6E-01	1.7E-01	7.7E-02
13	Beta-Endosulfan	1	5	1.2E+00	3.3E-03	7.4E-01	3.3E-03	3.4E-02	1.1E-04
14	Boron	0	0	ERR	ERR	ERR	–	1.8E-01	0.0E+00
15	Cadmium (food, soil)	0	5	6.0E-01	ERR	5.2E-01	0.0E+00	1.5E-02	0.0E+00
16	Cadmium (water)	0	0	ERR	ERR	ERR	–	NA	NA
17	Chlordane	4	5	3.3E-01	3.3E-01	1.7E-01	1.7E-01	8.5E-02	1.4E-02
18	Chromium	5	5	++	++	++	0.0E+00	3.9E-04	0.0E+00
19	Chrysene	3	4	3.3E-01	3.3E-01	2.8E-01	2.8E-01	9.0E-02	2.5E-02
20	Cyanide	0	4	2.5E+00	ERR	7.2E-01	0.0E+00	NA	NA
21	DDD	3	6	9.0E-02	3.1E-02	2.6E-02	2.6E-02	9.7E-02	2.5E-03
22	DDE	4	6	2.1E-01	2.1E-01	8.3E-02	8.3E-02	9.1E-02	7.6E-03
23	DDT	2	5	2.1E-01	1.7E-01	9.0E-02	9.0E-02	1.3E-01	1.2E-02
24	Dibenz (a,h) anthracene	0	4	1.6E-01	ERR	1.4E-01	0.0E+00	1.7E-01	0.0E+00
25	Dieldrin	1	5	1.5E-01	2.7E-02	5.2E-02	2.7E-02	5.2E-02	1.4E-03
26	Dimethylbenzene, 1,3- /	0	4	1.2E-01	ERR	8.7E-02	0.0E+00	3.1E-02	0.0E+00
27	Endrin	2	6	2.1E-01	4.7E-02	4.6E-02	4.6E-02	5.2E-02	2.4E-03
28	Fluoranthene	4	4	1.2E+00	1.2E+00	7.8E-01	7.8E-01	6.3E-02	4.9E-02
29	Fluorene	0	4	1.7E-01	ERR	6.6E-02	0.0E+00	4.2E-02	0.0E+00
30	Gamma-Chlordane	0	1	2.0E-03	ERR	2.0E-03	0.0E+00	8.5E-02	0.0E+00
31	Gamma-Hexachlorocycl	0	6	2.2E-01	ERR	3.7E-02	0.0E+00	4.3E-02	0.0E+00
32	Heptachlor	1	6	1.4E-01	3.1E-03	2.4E-02	3.1E-03	4.5E-02	1.4E-04
33	Heptachlor epoxide	4	6	1.8E-01	1.7E-02	3.5E-02	1.7E-02	7.9E-02	1.3E-03
34	Indeno (1,2,3-cd) pyrene	0	4	1.2E+00	ERR	9.3E-01	0.0E+00	1.4E-01	0.0E+00
35	Lead	5	5	7.5E+01	7.5E+01	6.8E+01	6.8E+01	1.0E-03	6.8E-02
36	Mercury	2	5	3.4E-01	3.4E-01	1.1E-01	1.1E-01	2.2E-02	2.3E-03
37	Naphthalene	0	4	3.7E-01	ERR	3.3E-01	0.0E+00	3.2E-02	0.0E+00
38	Nickel	5	5	5.1E+01	5.1E+01	2.8E+01	2.8E+01	4.9E-03	1.4E-01
39	Nitrate	0	0	ERR	ERR	ERR	–	2.5E+00	0.0E+00
40	Nitrite	0	0	ERR	ERR	ERR	–	2.5E+00	0.0E+00
41	PCB 1260	2	5	5.7E-01	5.7E-01	1.5E-01	1.5E-01	1.7E-01	2.7E-02
42	Phenanthrene	3	4	8.7E-01	8.7E-01	5.3E-01	5.3E-01	5.2E-02	2.7E-02
43	Pyrene	4	4	1.3E+00	1.3E+00	9.2E-01	9.2E-01	6.0E-02	5.6E-02
44	Silver	1	5	4.0E-01	4.5E-02	3.3E-01	4.5E-02	1.0E-02	4.7E-04
45	Sulfide	0	0	ERR	ERR	ERR	–	1.2E-01	0.0E+00
46	Tetrachloroethene	0	4	8.0E-02	ERR	6.0E-02	0.0E+00	3.3E-02	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–	NA	NA
48	Toluene	0	4	5.0E-02	ERR	3.9E-02	0.0E+00	3.1E-02	0.0E+00
49	Trichloroethylene	0	4	1.2E-01	ERR	8.7E-02	0.0E+00	3.4E-02	0.0E+00
50	Uranium	0	1	5.9E-02	ERR	5.9E-02	0.0E+00	3.6E-04	0.0E+00
51	Xylenes	0	3	3.9E-01	ERR	3.9E-01	0.0E+00	3.1E-02	0.0E+00

DATA STATISTICS

DATE: 08/18/93
FILENA STTS12Z1.WQ1

EXPOSURE POINT: ON-SITE - ZONE 1
MEDIUM: SOIL (0-12")
UNITS: MG/KG
U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC	BCv	VEGEPC
1	Acenaphthene	0	6	2.1E-01	ERR	5.1E-02	0.0E+00	3.9E-02	0.0E+00
2	Acenaphthylene	2	6	++	++	++	0.0E+00	4.1E-02	0.0E+00
3	Aldrin	0	8	1.5E-01	ERR	1.9E-02	0.0E+00	3.1E-02	0.0E+00
4	Alpha-Chlordane	1	2	5.0E-01	1.3E-01	3.2E-01	1.3E-01	8.5E-02	1.1E-02
5	Alpha-Endosulfan	0	7	5.0E-02	ERR	7.6E-03	0.0E+00	3.4E-02	0.0E+00
6	Anthracene	0	6	3.6E-01	ERR	3.4E-01	0.0E+00	5.1E-02	0.0E+00
7	Benzene	0	6	5.0E-02	ERR	4.2E-02	0.0E+00	4.0E-02	0.0E+00
8	Benzo (a) anthracene	6	6	6.3E-01	6.3E-01	3.2E-01	3.2E-01	9.0E-02	2.8E-02
9	Benzo (a) pyrene	0	6	6.0E-01	ERR	5.3E-01	0.0E+00	1.1E-01	0.0E+00
10	Benzo (b) fluoranthene	2	6	9.9E-01	9.9E-01	3.9E-01	3.9E-01	1.1E-01	4.4E-02
11	Benzo (g,h,i) perylene	2	6	1.3E+00	1.3E+00	3.6E-01	3.6E-01	1.9E-01	6.9E-02
12	Benzo (k) fluoranthene	2	6	7.7E-01	7.7E-01	3.3E-01	3.3E-01	1.7E-01	5.5E-02
13	Beta-Endosulfan	1	7	1.2E+00	3.3E-03	5.3E-01	3.3E-03	3.4E-02	1.1E-04
14	Boron	0	0	ERR	ERR	ERR	–	1.8E-01	0.0E+00
15	Cadmium (food, soil)	0	7	6.0E-01	ERR	5.5E-01	0.0E+00	1.5E-02	0.0E+00
16	Cadmium (water)	0	0	ERR	ERR	ERR	–	NA	NA
17	Chlordane	4	7	3.3E-01	3.3E-01	1.3E-01	1.3E-01	8.5E-02	1.1E-02
18	Chromium	7	7	++	++	++	0.0E+00	3.9E-04	0.0E+00
19	Chrysene	5	6	3.3E-01	3.3E-01	2.4E-01	2.4E-01	9.0E-02	2.1E-02
20	Cyanide	0	6	2.5E+00	ERR	5.2E-01	0.0E+00	NA	NA
21	DDD	3	8	9.0E-02	3.1E-02	2.0E-02	2.0E-02	9.7E-02	1.9E-03
22	DDE	4	8	2.1E-01	2.1E-01	6.2E-02	6.2E-02	9.1E-02	5.7E-03
23	DDT	2	7	2.1E-01	1.7E-01	6.5E-02	6.5E-02	1.3E-01	8.4E-03
24	Dibenz (a,h) anthracene	0	6	1.6E-01	ERR	1.5E-01	0.0E+00	1.7E-01	0.0E+00
25	Dieldrin	1	7	1.5E-01	2.7E-02	3.7E-02	2.7E-02	5.2E-02	1.4E-03
26	Dimethylbenzene, 1,3- /	0	6	1.2E-01	ERR	9.6E-02	0.0E+00	3.1E-02	0.0E+00
27	Endrin	2	8	2.1E-01	4.7E-02	3.5E-02	3.5E-02	5.2E-02	1.8E-03
28	Fluoranthene	6	6	1.2E+00	1.2E+00	6.3E-01	6.3E-01	6.3E-02	3.9E-02
29	Fluorene	0	6	1.7E-01	ERR	5.5E-02	0.0E+00	4.2E-02	0.0E+00
30	Gamma-Chlordane	0	1	2.0E-03	ERR	2.0E-03	0.0E+00	8.5E-02	0.0E+00
31	Gamma-Hexachlorocycl	0	8	2.2E-01	ERR	2.8E-02	0.0E+00	4.3E-02	0.0E+00
32	Heptachlor	1	8	1.4E-01	3.1E-03	1.9E-02	3.1E-03	4.5E-02	1.4E-04
33	Heptachlor epoxide	4	8	1.8E-01	1.7E-02	2.7E-02	1.7E-02	7.9E-02	1.3E-03
34	Indeno (1,2,3-cd) pyrene	0	6	1.2E+00	ERR	1.0E+00	0.0E+00	1.4E-01	0.0E+00
35	Lead	7	7	7.5E+01	7.5E+01	6.4E+01	6.4E+01	1.0E-03	6.5E-02
36	Mercury	3	7	3.4E-01	3.4E-01	9.6E-02	9.6E-02	2.2E-02	2.1E-03
37	Naphthalene	0	6	3.7E-01	ERR	3.4E-01	0.0E+00	3.2E-02	0.0E+00
38	Nickel	7	7	5.1E+01	5.1E+01	2.4E+01	2.4E+01	4.9E-03	1.2E-01
39	Nitrate	0	0	ERR	ERR	ERR	–	2.5E+00	0.0E+00
40	Nitrite	0	0	ERR	ERR	ERR	–	2.5E+00	0.0E+00
41	PCB 1260	2	7	5.7E-01	5.7E-01	1.2E-01	1.2E-01	1.7E-01	2.0E-02
42	Phenanthrene	5	6	8.7E-01	8.7E-01	4.5E-01	4.5E-01	5.2E-02	2.4E-02
43	Pyrene	6	6	1.3E+00	1.3E+00	7.5E-01	7.5E-01	6.0E-02	4.5E-02
44	Silver	1	7	4.0E-01	4.5E-02	3.5E-01	4.5E-02	1.0E-02	4.7E-04
45	Sulfide	0	0	ERR	ERR	ERR	–	1.2E-01	0.0E+00
46	Tetrachloroethene	0	6	8.0E-02	ERR	6.7E-02	0.0E+00	3.3E-02	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–	NA	NA
48	Toluene	0	6	5.0E-02	ERR	4.2E-02	0.0E+00	3.1E-02	0.0E+00
49	Trichloroethylene	0	6	1.2E-01	ERR	9.6E-02	0.0E+00	3.4E-02	0.0E+00
50	Uranium	0	1	5.9E-02	ERR	5.9E-02	0.0E+00	3.6E-04	0.0E+00
51	Xylenes	0	5	3.9E-01	ERR	3.9E-01	0.0E+00	3.1E-02	0.0E+00

DATA STATISTICS

DATE: 08/18/93

FILENA STTS-2Z2.WQ1

EXPOSURE POINT: ON-SITE - ZONE 2

MEDIUM: SOILS (0-2')

UNITS: MG/KG

U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	13	27	2.1E+00	8.1E-01	3.2E-01	3.2E-01
2	Acenaphthylene	10	27	++	++	++	0.0E+00
3	Aldrin	1	34	6.5E-01	5.1E-02	1.2E-01	5.1E-02
4	Alpha-Chlordane	6	6	1.5E+00	1.5E+00	3.8E-01	3.8E-01
5	Alpha-Endosulfan	2	31	5.0E-01	6.0E-03	6.2E-02	6.0E-03
6	Anthracene	4	27	3.4E+00	3.4E+00	8.6E-01	8.6E-01
7	Benzene	1	25	2.6E-01	2.6E-01	4.7E-02	4.7E-02
8	Benzo (a) anthracene	24	27	1.2E+01	1.2E+01	1.7E+00	1.7E+00
9	Benzo (a) pyrene	7	27	1.1E+01	1.1E+01	1.8E+00	1.8E+00
10	Benzo (b) fluoranthene	13	27	1.2E+01	1.2E+01	1.9E+00	1.9E+00
11	Benzo (g,h,i) perylene	14	27	8.1E+00	8.1E+00	1.7E+00	1.7E+00
12	Benzo (k) fluoranthene	15	27	8.6E+00	8.6E+00	1.7E+00	1.7E+00
13	Beta-Endosulfan	12	30	1.2E+00	4.7E-02	5.2E-01	4.7E-02
14	Boron	0	2	3.7E+00	ERR	3.7E+00	0.0E+00
15	Cadmium (food, soil)	7	42	1.0E+01	1.0E+01	9.7E-01	9.7E-01
16	Cadmium (water)	0	0	ERR	ERR	ERR	–
17	Chlordane	13	32	9.4E+00	9.4E+00	8.3E-01	8.3E-01
18	Chromium	42	42	++	++	++	0.0E+00
19	Chrysene	19	27	6.6E+00	6.6E+00	1.2E+00	1.2E+00
20	Cyanide	3	23	2.5E+00	2.1E+00	6.7E-01	6.7E-01
21	DDD	17	34	3.5E+00	3.5E+00	1.2E-01	1.2E-01
22	DDE	18	34	5.9E+00	5.9E+00	2.2E-01	2.2E-01
23	DDT	15	32	2.1E+00	1.2E+00	2.7E-01	2.7E-01
24	Dibenz (a,h) anthracene	6	27	1.7E+00	1.7E+00	3.8E-01	3.8E-01
25	Dieldrin	10	29	4.0E+00	4.0E+00	1.8E-01	1.8E-01
26	Dimethylbenzene, 1,3- /	0	23	1.2E-01	ERR	9.6E-02	0.0E+00
27	Endrin	9	32	6.5E-01	1.8E-01	1.6E-01	1.6E-01
28	Fluoranthene	23	27	6.2E+00	6.2E+00	2.1E+00	2.1E+00
29	Fluorene	11	27	++	++	++	0.0E+00
30	Gamma-Chlordane	6	6	1.6E+00	1.6E+00	4.0E-01	4.0E-01
31	Gamma-Hexachlorocycl	5	34	5.0E-02	1.3E-02	1.3E-02	1.3E-02
32	Heptachlor	5	34	1.2E-01	5.2E-02	2.9E-02	2.9E-02
33	Heptachlor epoxide	13	34	8.7E-01	8.7E-01	9.2E-02	9.2E-02
34	Indeno (1,2,3-cd) pyrene	5	27	1.4E+01	1.4E+01	2.3E+00	2.3E+00
35	Lead	38	39	7.2E+03	7.2E+03	3.9E+02	3.9E+02
36	Mercury	29	37	4.5E+00	4.5E+00	2.8E-01	2.8E-01
37	Naphthalene	0	27	2.1E+00	ERR	4.9E-01	0.0E+00
38	Nickel	42	42	2.7E+02	2.7E+02	3.4E+01	3.4E+01
39	Nitrate	0	0	ERR	ERR	ERR	–
40	Nitrite, nitrate - nonspec	2	2	6.1E+00	6.1E+00	5.3E+00	5.3E+00
41	PCB 1260	7	36	4.5E+00	4.5E+00	3.0E-01	3.0E-01
42	Phenanthrene	23	27	1.5E+01	1.5E+01	2.7E+00	2.7E+00
43	Pyrene	26	27	1.1E+01	1.1E+01	2.7E+00	2.7E+00
44	Silver	5	38	1.4E+01	1.4E+01	7.7E-01	7.7E-01
45	Sulfide	1	1	2.8E+02	2.8E+02	2.8E+02	2.8E+02
46	Tetrachloroethene	1	25	8.0E-02	2.0E-03	6.1E-02	2.0E-03
47	Tetrazene	0	0	ERR	ERR	ERR	–
48	Toluene	1	25	2.1E-01	2.1E-01	4.5E-02	4.5E-02
49	Trichloroethylene	0	25	1.2E-01	ERR	8.8E-02	0.0E+00
50	Uranium	0	4	5.8E-02	ERR	5.6E-02	0.0E+00
51	Xylenes	0	19	3.9E-01	ERR	3.9E-01	0.0E+00

DATA STATISTICS

DATE: 08/18/93

FILENA STTS-2Z3.WQ1

EXPOSURE POINT: ON-SITE - ZONE 3

MEDIUM: SOILS (0-2')

UNITS: MG/KG

U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	5	8	1.4E+00	1.4E+00	3.6E-01	3.6E-01
2	Acenaphthylene	5	8	++	++	++	0.0E+00
3	Aldrin	2	11	7.3E-03	7.3E-03	3.9E-03	3.9E-03
4	Alpha-Chlordane	3	3	6.6E-02	6.6E-02	2.5E-02	2.5E-02
5	Alpha-Endosulfan	1	8	3.3E-02	3.3E-02	5.7E-03	5.7E-03
6	Anthracene	3	8	2.8E+00	2.8E+00	1.1E+00	1.1E+00
7	Benzene	0	8	5.0E-02	ERR	5.0E-02	0.0E+00
8	Benzo (a) anthracene	7	8	7.4E+00	7.4E+00	2.2E+00	2.2E+00
9	Benzo (a) pyrene	3	8	8.1E+00	8.1E+00	2.6E+00	2.6E+00
10	Benzo (b) fluoranthene	7	8	7.7E+00	7.7E+00	3.0E+00	3.0E+00
11	Benzo (g,h,i) perylene	5	8	7.2E+00	7.2E+00	1.9E+00	1.9E+00
12	Benzo (k) fluoranthene	6	8	5.6E+00	5.6E+00	2.3E+00	2.3E+00
13	Beta-Endosulfan	5	9	1.2E+00	1.3E-01	2.8E-01	1.3E-01
14	Boron	0	0	ERR	ERR	ERR	–
15	Cadmium (food, soil)	2	10	1.3E+01	1.3E+01	2.8E+00	2.8E+00
16	Cadmium (water)	0	0	ERR	ERR	ERR	–
17	Chlordane	4	9	1.8E+00	1.8E+00	5.2E-01	5.2E-01
18	Chromium	10	10	++	++	++	0.0E+00
19	Chrysene	7	8	6.9E+00	6.9E+00	2.3E+00	2.3E+00
20	Cyanide	0	7	1.3E-01	ERR	1.3E-01	0.0E+00
21	DDD	5	12	2.0E-01	2.0E-01	2.9E-02	2.9E-02
22	DDE	5	12	3.1E-01	3.1E-01	4.0E-02	4.0E-02
23	DDT	5	9	8.2E-01	8.2E-01	1.4E-01	1.4E-01
24	Dibenz (a,h) anthracene	2	8	8.1E-01	8.1E-01	2.9E-01	2.9E-01
25	Dieldrin	5	11	6.5E-02	6.5E-02	2.0E-02	2.0E-02
26	Dimethylbenzene, 1,3- /	0	8	1.2E-01	ERR	1.2E-01	0.0E+00
27	Endrin	3	12	6.5E-01	8.7E-02	7.5E-02	7.5E-02
28	Fluoranthene	8	8	6.5E+00	6.5E+00	3.0E+00	3.0E+00
29	Fluorene	4	8	++	++	++	0.0E+00
30	Gamma-Chlordane	0	3	2.0E-03	ERR	2.0E-03	0.0E+00
31	Gamma-Hexachlorocycl	2	12	5.0E-02	3.2E-02	8.8E-03	8.8E-03
32	Heptachlor	4	12	1.4E-02	1.4E-02	4.5E-03	4.5E-03
33	Heptachlor epoxide	6	11	4.4E-02	4.4E-02	1.2E-02	1.2E-02
34	Indeno (1,2,3-cd) pyrene	2	8	1.1E+01	1.1E+01	2.9E+00	2.9E+00
35	Lead	10	10	8.6E+02	8.6E+02	2.9E+02	2.9E+02
36	Mercury	7	10	1.0E+00	1.0E+00	3.5E-01	3.5E-01
37	Naphthalene	1	8	5.1E+00	5.1E+00	9.6E-01	9.6E-01
38	Nickel	10	10	7.4E+02	7.4E+02	9.9E+01	9.9E+01
39	Nitrate	0	0	ERR	ERR	ERR	–
40	Nitrite	0	0	ERR	ERR	ERR	–
41	PCB 1260	3	13	5.9E-01	5.9E-01	1.4E-01	1.4E-01
42	Phenanthrene	8	8	1.1E+01	1.1E+01	4.3E+00	4.3E+00
43	Pyrene	8	8	7.5E+00	7.5E+00	3.8E+00	3.8E+00
44	Silver	1	10	3.9E+01	3.9E+01	4.3E+00	4.3E+00
45	Sulfide	2	2	1.3E+02	1.3E+02	1.1E+02	1.1E+02
46	Tetrachloroethene	0	8	8.0E-02	ERR	8.0E-02	0.0E+00
47	Tetrazene	0	2	6.1E-01	ERR	6.1E-01	0.0E+00
48	Toluene	0	8	5.0E-02	ERR	5.0E-02	0.0E+00
49	Trichloroethylene	0	8	1.2E-01	ERR	1.2E-01	0.0E+00
50	Uranium	0	0	ERR	ERR	ERR	–
51	Xylenes	0	8	3.9E-01	ERR	3.9E-01	0.0E+00

DATA STATISTICS

DATE: 08/18/93

EXPOSURE POINT: ON-SITE - ZONE 4

FILENA STTS-2Z4.WQ1

MEDIUM: SOILS (0-2')

UNITS: MG/KG

U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	1	10	2.1E-01	1.7E-01	7.2E-02	7.2E-02
2	Acenaphthylene	1	10	++	++	++	0.0E+00
3	Aldrin	1	13	6.5E-01	7.6E-03	1.5E-01	7.6E-03
4	Alpha-Chlordane	2	2	3.2E-02	3.2E-02	2.9E-02	2.9E-02
5	Alpha-Endosulfan	1	12	2.0E-01	6.8E-03	7.6E-02	6.8E-03
6	Anthracene	0	10	3.6E-01	ERR	3.4E-01	0.0E+00
7	Benzene	0	7	5.0E-02	ERR	3.6E-02	0.0E+00
8	Benzo (a) anthracene	7	10	7.9E-01	7.9E-01	3.6E-01	3.6E-01
9	Benzo (a) pyrene	1	10	8.3E-01	8.3E-01	5.8E-01	5.8E-01
10	Benzo (b) fluoranthene	4	10	1.8E+00	1.8E+00	5.8E-01	5.8E-01
11	Benzo (g,h,i) perylene	4	10	1.3E+00	1.3E+00	4.4E-01	4.4E-01
12	Benzo (k) fluoranthene	4	10	1.3E+00	1.3E+00	5.1E-01	5.1E-01
13	Beta-Endosulfan	1	12	1.2E+00	6.3E-03	6.2E-01	6.3E-03
14	Boron	1	1	1.1E+01	1.1E+01	1.1E+01	1.1E+01
15	Cadmium (food, soil)	2	14	3.5E+00	3.5E+00	7.9E-01	7.9E-01
16	Cadmium (water)	0	0	ERR	ERR	ERR	–
17	Chlordane	7	13	5.1E+00	5.1E+00	1.5E+00	1.5E+00
18	Chromium	14	14	++	++	++	0.0E+00
19	Chrysene	6	10	2.2E+00	2.2E+00	6.9E-01	6.9E-01
20	Cyanide	1	7	2.5E+00	3.2E-01	8.3E-01	3.2E-01
21	DDD	7	13	8.2E-01	8.2E-01	1.9E-01	1.9E-01
22	DDE	12	13	1.3E+00	1.3E+00	3.6E-01	3.6E-01
23	DDT	8	13	5.2E+00	5.2E+00	9.4E-01	9.4E-01
24	Dibenz (a,h) anthracene	0	10	1.6E-01	ERR	1.4E-01	0.0E+00
25	Dieldrin	5	11	7.5E-02	7.5E-02	3.5E-02	3.5E-02
26	Dimethylbenzene, 1,3- /	0	7	1.2E-01	ERR	8.3E-02	0.0E+00
27	Endrin	6	13	6.5E-01	5.0E-01	3.8E-01	3.8E-01
28	Fluoranthene	9	10	1.2E+00	1.2E+00	6.4E-01	6.4E-01
29	Fluorene	0	10	1.7E-01	ERR	5.9E-02	0.0E+00
30	Gamma-Chlordane	2	2	4.2E-02	4.2E-02	3.2E-02	3.2E-02
31	Gamma-Hexachlorocycl	0	13	5.0E-02	ERR	1.7E-02	0.0E+00
32	Heptachlor	0	13	1.2E-01	ERR	2.9E-02	0.0E+00
33	Heptachlor epoxide	7	13	2.4E-01	1.2E-01	8.8E-02	8.8E-02
34	Indeno (1,2,3-cd) pyrene	1	10	1.2E+00	3.2E-01	1.0E+00	3.2E-01
35	Lead	13	13	5.2E+02	5.2E+02	2.5E+02	2.5E+02
36	Mercury	12	14	5.7E-01	5.7E-01	2.4E-01	2.4E-01
37	Naphthalene	0	10	3.7E-01	ERR	3.4E-01	0.0E+00
38	Nickel	14	14	5.2E+01	5.2E+01	2.1E+01	2.1E+01
39	Nitrate	0	0	ERR	ERR	ERR	–
40	Nitrite, nitrate - nonspec	2	2	6.3E+00	6.3E+00	5.7E+00	5.7E+00
41	PCB 1260	2	14	4.9E+00	4.9E+00	6.1E-01	6.1E-01
42	Phenanthrene	7	10	2.2E+00	2.2E+00	6.0E-01	6.0E-01
43	Pyrene	10	10	1.7E+00	1.7E+00	9.7E-01	9.7E-01
44	Silver	1	14	4.0E-01	5.5E-02	3.5E-01	5.5E-02
45	Sulfide	2	2	2.7E+02	2.7E+02	2.6E+02	2.6E+02
46	Tetrachloroethene	0	7	8.0E-02	ERR	5.7E-02	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–
48	Toluene	0	7	5.0E-02	ERR	3.7E-02	0.0E+00
49	Trichloroethylene	0	7	1.2E-01	ERR	8.3E-02	0.0E+00
50	Uranium	0	2	5.9E-02	ERR	5.9E-02	0.0E+00
51	Xylenes	0	5	3.9E-01	ERR	3.9E-01	0.0E+00

DATA STATISTICS

DATE: 08/18/93
FILENA STTS12Z4.WQ1

EXPOSURE POINT: ON-SITE - ZONE 4
MEDIUM: SOILS (0-12")
UNITS: MG/KG
U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC	BCv	VEGEPC
1	Acenaphthene	2	17	6.3E+00	6.3E+00	4.3E-01	4.3E-01	3.9E-02	1.7E-02
2	Acenaphthylene	1	17	++	++	++	0.0E+00	4.1E-02	0.0E+00
3	Aldrin	1	20	6.5E-01	7.6E-03	1.0E-01	7.6E-03	3.1E-02	2.3E-04
4	Alpha-Chlordane	2	2	3.2E-02	3.2E-02	2.9E-02	2.9E-02	8.5E-02	2.5E-03
5	Alpha-Endosulfan	2	17	2.0E-01	6.8E-03	5.4E-02	6.8E-03	3.4E-02	2.3E-04
6	Anthracene	2	17	1.4E+01	1.4E+01	1.1E+00	1.1E+00	5.1E-02	5.8E-02
7	Benzene	0	17	5.0E-02	ERR	3.0E-02	0.0E+00	4.0E-02	0.0E+00
8	Benzo (a) anthracene	9	17	9.3E+00	9.3E+00	7.8E-01	7.8E-01	9.0E-02	7.0E-02
9	Benzo (a) pyrene	2	17	7.1E+00	7.1E+00	9.4E-01	9.4E-01	1.1E-01	1.1E-01
10	Benzo (b) fluoranthene	5	17	4.5E+00	4.5E+00	6.6E-01	6.6E-01	1.1E-01	7.5E-02
11	Benzo (g,h,i) perylene	5	17	4.4E+00	4.4E+00	5.6E-01	5.6E-01	1.9E-01	1.1E-01
12	Benzo (k) fluoranthene	5	17	4.5E+00	4.5E+00	5.9E-01	5.9E-01	1.7E-01	9.9E-02
13	Beta-Endosulfan	2	17	1.2E+00	6.3E-03	4.4E-01	6.3E-03	3.4E-02	2.1E-04
14	Boron	1	1	1.1E+01	1.1E+01	1.1E+01	1.1E+01	1.8E-01	1.9E+00
15	Cadmium (food, soil)	2	24	3.5E+00	3.5E+00	6.9E-01	6.9E-01	1.5E-02	1.1E-02
16	Cadmium (water)	0	0	ERR	ERR	ERR	–	NA	NA
17	Chlordane	9	20	5.1E+00	5.1E+00	9.9E-01	9.9E-01	8.5E-02	8.4E-02
18	Chromium	24	24	++	++	++	0.0E+00	3.9E-04	0.0E+00
19	Chrysene	9	17	9.3E+00	9.3E+00	9.9E-01	9.9E-01	9.0E-02	8.9E-02
20	Cyanide	1	13	2.5E+03	3.2E-01	3.8E+02	3.2E-01	NA	NA
21	DDD	8	20	8.2E-01	8.2E-01	1.2E-01	1.2E-01	9.7E-02	1.2E-02
22	DDE	13	20	1.3E+00	1.3E+00	2.4E-01	2.4E-01	9.1E-02	2.2E-02
23	DDT	10	20	5.2E+00	5.2E+00	6.2E-01	6.2E-01	1.3E-01	8.0E-02
24	Dibenz (a,h) anthracene	1	17	1.4E+00	1.4E+00	2.3E-01	2.3E-01	1.7E-01	3.8E-02
25	Dieldrin	6	18	7.5E-02	7.5E-02	2.2E-02	2.2E-02	5.2E-02	1.2E-03
26	Dimethylbenzene, 1,3- /	0	12	1.2E-01	ERR	9.6E-02	0.0E+00	3.1E-02	0.0E+00
27	Endrin	8	20	7.9E-01	7.9E-01	3.0E-01	3.0E-01	5.2E-02	1.5E-02
28	Fluoranthene	13	17	2.0E+01	2.0E+01	1.6E+00	1.6E+00	6.3E-02	1.0E-01
29	Fluorene	0	15	1.7E-01	ERR	5.0E-02	0.0E+00	4.2E-02	0.0E+00
30	Gamma-Chlordane	2	2	4.2E-02	4.2E-02	3.2E-02	3.2E-02	8.5E-02	2.7E-03
31	Gamma-Hexachlorocycl	0	20	5.0E-02	ERR	1.3E-02	0.0E+00	4.3E-02	0.0E+00
32	Heptachlor	0	20	1.2E-01	ERR	2.0E-02	0.0E+00	4.5E-02	0.0E+00
33	Heptachlor epoxide	8	20	2.4E-01	1.2E-01	6.3E-02	6.3E-02	7.9E-02	4.9E-03
34	Indeno (1,2,3-cd) pyrene	1	17	1.2E+00	3.2E-01	9.7E-01	3.2E-01	1.4E-01	4.7E-02
35	Lead	17	23	5.2E+02	5.2E+02	1.7E+02	1.7E+02	1.0E-03	1.7E-01
36	Mercury	18	24	5.7E-01	5.7E-01	1.9E-01	1.9E-01	2.2E-02	4.1E-03
37	Naphthalene	1	17	4.0E+00	4.0E+00	5.5E-01	5.5E-01	3.2E-02	1.8E-02
38	Nickel	24	24	5.2E+01	5.2E+01	1.7E+01	1.7E+01	4.9E-03	8.5E-02
39	Nitrate	0	0	ERR	ERR	ERR	–	2.5E+00	0.0E+00
40	Nitrite, nitrate - nonspec	2	2	6.3E+00	6.3E+00	5.7E+00	5.7E+00	2.5E+00	1.4E+01
41	PCB 1260	2	21	4.9E+00	4.9E+00	4.4E-01	4.4E-01	1.7E-01	7.6E-02
42	Phenanthrene	8	17	2.2E+00	2.2E+00	4.6E-01	4.6E-01	5.2E-02	2.4E-02
43	Pyrene	13	17	2.7E+01	2.7E+01	2.2E+00	2.2E+00	6.0E-02	1.4E-01
44	Silver	1	24	4.0E-01	5.5E-02	3.6E-01	5.5E-02	1.0E-02	5.7E-04
45	Sulfide	2	2	2.7E+02	2.7E+02	2.6E+02	2.6E+02	1.2E-01	3.2E+01
46	Tetrachloroethene	0	17	8.0E-02	ERR	4.8E-02	0.0E+00	3.3E-02	0.0E+00
47	Tetrazene	1	2	1.4E+00	1.4E+00	1.0E+00	1.0E+00	NA	NA
48	Toluene	0	17	5.0E-02	ERR	3.1E-02	0.0E+00	3.1E-02	0.0E+00
49	Trichloroethylene	0	17	1.2E-01	ERR	6.8E-02	0.0E+00	3.4E-02	0.0E+00
50	Uranium	0	7	4.6E+01	ERR	1.7E+01	0.0E+00	3.6E-04	0.0E+00
51	Xylenes	0	10	3.9E-01	ERR	3.9E-01	0.0E+00	3.1E-02	0.0E+00

DATA STATISTICS DATE: 08/18/93

EXPOSURE POINT: RIVERSIDE PARK FILENA PK-STATS.WQ1

MEDIUM: SOIL (0-2')

UNITS: MG/KG

U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	3	11	2.1E+00	3.6E-01	5.1E-01	3.6E-01
2	Acenaphthylene	6	11	++	++	++	0.0E+00
3	Aldrin	0	11	6.5E-01	ERR	6.2E-02	0.0E+00
4	Alpha-Chlordane	3	5	5.8E-02	5.8E-02	1.6E-02	1.6E-02
5	Alpha-Endosulfan	1	11	5.0E-01	2.5E-03	1.1E-01	2.5E-03
6	Anthracene	3	11	1.5E+01	1.5E+01	2.4E+00	2.4E+00
7	Benzene	0	11	5.0E-02	ERR	2.8E-02	0.0E+00
8	Benzo (a) anthracene	8	11	3.2E+01	3.2E+01	4.1E+00	4.1E+00
9	Benzo (a) pyrene	3	11	3.7E+01	3.7E+01	4.8E+00	4.8E+00
10	Benzo (b) fluoranthene	5	11	1.5E+01	1.5E+01	2.5E+00	2.5E+00
11	Benzo (g,h,i) perylene	6	11	1.4E+01	1.4E+01	2.5E+00	2.5E+00
12	Benzo (k) fluoranthene	7	11	2.4E+01	2.4E+01	3.7E+00	3.7E+00
13	Beta-Endosulfan	1	11	1.2E+00	1.3E-02	5.4E-01	1.3E-02
14	Boron	0	1	3.7E+00	ERR	3.7E+00	0.0E+00
15	Cadmium (food, soil)	0	12	6.0E-01	ERR	4.3E-01	0.0E+00
16	Cadmium (water)	0	0	ERR	ERR	ERR	-
17	Chlordane	4	11	1.5E+01	1.7E+00	1.8E+00	1.7E+00
18	Chromium	12	12	++	++	++	0.0E+00
19	Chrysene	7	11	3.4E+01	3.4E+01	4.2E+00	4.2E+00
20	Cyanide	2	11	2.5E+00	4.3E-01	1.3E+00	4.3E-01
21	DDD	3	11	1.9E+00	1.9E+00	1.9E-01	1.9E-01
22	DDE	7	11	6.3E+00	6.3E+00	6.0E-01	6.0E-01
23	DDT	4	11	3.8E+00	3.8E+00	8.0E-01	8.0E-01
24	Dibenz (a,h) anthracene	2	11	3.3E+00	3.3E+00	5.3E-01	5.3E-01
25	Dieldrin	4	11	8.6E-02	8.6E-02	2.0E-02	2.0E-02
26	Dimethylbenzene, 1,3- /	0	11	1.2E-01	ERR	6.4E-02	0.0E+00
27	Endrin	1	11	6.5E-01	9.9E-02	1.9E-01	9.9E-02
28	Fluoranthene	8	11	5.4E+01	5.4E+01	6.9E+00	6.9E+00
29	Fluorene	4	11	++	++	++	0.0E+00
30	Gamma-Chlordane	1	5	3.2E-02	3.2E-02	8.0E-03	8.0E-03
31	Gamma-Hexachlorocycl	0	11	5.0E-02	ERR	1.9E-02	0.0E+00
32	Heptachlor	0	11	1.2E-01	ERR	2.3E-02	0.0E+00
33	Heptachlor epoxide	3	11	3.0E-02	3.0E-02	6.7E-03	6.7E-03
34	Indeno (1,2,3-cd) pyrene	3	11	1.0E+01	1.0E+01	2.7E+00	2.7E+00
35	Lead	10	11	4.1E+02	4.1E+02	1.7E+02	1.7E+02
36	Mercury	2	6	1.0E-01	1.0E-01	3.7E-02	3.7E-02
37	Naphthalene	0	11	2.1E+00	ERR	6.4E-01	0.0E+00
38	Nickel	12	12	4.1E+01	4.1E+01	2.3E+01	2.3E+01
39	Nitrate	0	0	ERR	ERR	ERR	-
40	Nitrite	0	0	ERR	ERR	ERR	-
41	PCB 1260	1	11	2.4E-01	2.0E-01	6.0E-02	6.0E-02
42	Phenanthrene	7	11	1.7E+01	1.7E+01	4.3E+00	4.3E+00
43	Pyrene	8	11	5.3E+01	5.3E+01	7.0E+00	7.0E+00
44	Silver	0	10	4.0E-01	ERR	2.1E-01	0.0E+00
45	Sulfide	0	0	ERR	ERR	ERR	-
46	Tetrachloroethene	0	11	8.0E-02	ERR	4.4E-02	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	-
48	Toluene	0	11	5.0E-02	ERR	2.9E-02	0.0E+00
49	Trichloroethylene	0	11	1.2E-01	ERR	6.4E-02	0.0E+00
50	Uranium	1	5	1.5E-01	1.5E-01	7.7E-02	7.7E-02
51	Xylenes	0	6	3.9E-01	ERR	3.9E-01	0.0E+00

DATA STATISTICS

DATE: 08/18/93

EXPOSURE POINT: RIVER

FILENA STAT-SD3.WQ1

MEDIUM: SEDIMENTS

UNITS: MG/KG

U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	3	4	7.2E-01	7.2E-01	4.2E-01	4.2E-01
2	Acenaphthylene	3	4	2.5E+00	2.5E+00	1.4E+00	1.4E+00
3	Aldrin	2	4	8.5E-02	8.5E-02	2.7E-02	2.7E-02
4	Alpha-Chlordane	0	0	ERR	ERR	ERR	–
5	Alpha-Endosulfan	1	4	5.5E-02	5.5E-02	1.4E-02	1.4E-02
6	Anthracene	0	4	3.6E-01	ERR	3.6E-01	0.0E+00
7	Benzene	0	4	5.0E-02	ERR	5.0E-02	0.0E+00
8	Benzo (a) anthracene	4	4	9.0E+00	9.0E+00	5.2E+00	5.2E+00
9	Benzo (a) pyrene	0	4	6.0E-01	ERR	6.0E-01	0.0E+00
10	Benzo (b) fluoranthene	4	4	1.0E+01	1.0E+01	5.5E+00	5.5E+00
11	Benzo (g,h,i) perylene	2	4	3.1E+00	3.1E+00	1.2E+00	1.2E+00
12	Benzo (k) fluoranthene	4	4	9.9E+00	9.9E+00	6.1E+00	6.1E+00
13	Beta-Endosulfan	1	4	1.5E-02	1.5E-02	4.1E-03	4.1E-03
14	Boron	0	0	ERR	ERR	ERR	–
15	Cadmium (food, soil)	4	4	1.8E+01	1.8E+01	1.1E+01	1.1E+01
16	Cadmium (water)	0	0	ERR	ERR	ERR	–
17	Chlordane	0	4	3.4E-02	ERR	3.4E-02	0.0E+00
18	Chromium	4	4	1.5E+02	1.5E+02	1.3E+02	1.3E+02
19	Chrysene	4	4	1.1E+01	1.1E+01	6.0E+00	6.0E+00
20	Cyanide	0	4	1.3E-01	ERR	1.3E-01	0.0E+00
21	DDD	3	4	2.6E-01	2.6E-01	1.5E-01	1.5E-01
22	DDE	3	4	2.4E-01	2.4E-01	1.2E-01	1.2E-01
23	DDT	4	4	5.3E-01	5.3E-01	2.3E-01	2.3E-01
24	Dibenz (a,h) anthracene	0	4	1.6E-01	ERR	1.6E-01	0.0E+00
25	Dieldrin	1	4	5.7E-02	5.7E-02	1.5E-02	1.5E-02
26	Dimethylbenzene, 1,3- /	0	4	1.2E-01	ERR	1.2E-01	0.0E+00
27	Endrin	1	4	3.1E-02	3.1E-02	1.0E-02	1.0E-02
28	Fluoranthene	4	4	1.0E+01	1.0E+01	8.2E+00	8.2E+00
29	Fluorene	4	4	1.5E+00	1.5E+00	1.0E+00	1.0E+00
30	Gamma-Chlordane	0	2	2.0E-03	ERR	2.0E-03	0.0E+00
31	Gamma-Hexachlorocycl	0	4	5.0E-04	ERR	5.0E-04	0.0E+00
32	Heptachlor	0	4	1.1E-03	ERR	1.1E-03	0.0E+00
33	Heptachlor epoxide	1	4	2.6E-02	2.6E-02	7.0E-03	7.0E-03
34	Indeno (1,2,3-cd) pyrene	1	4	3.7E+01	3.7E+01	1.0E+01	1.0E+01
35	Lead	4	4	8.5E+02	8.5E+02	6.3E+02	6.3E+02
36	Mercury	4	4	1.2E+00	1.2E+00	8.1E-01	8.1E-01
37	Naphthalene	0	4	3.7E-01	ERR	3.7E-01	0.0E+00
38	Nickel	4	4	5.5E+01	5.5E+01	4.0E+01	4.0E+01
39	Nitrate	0	0	ERR	ERR	ERR	–
40	Nitrite	0	0	ERR	ERR	ERR	–
41	PCB 1260	0	4	2.4E-02	ERR	2.4E-02	0.0E+00
42	Phenanthrene	4	4	8.4E+00	8.4E+00	6.1E+00	6.1E+00
43	Pyrene	4	4	1.3E+01	1.3E+01	1.0E+01	1.0E+01
44	Silver	2	4	6.0E+00	6.0E+00	2.5E+00	2.5E+00
45	Sulfide	0	0	ERR	ERR	ERR	–
46	Tetrachloroethene	0	4	8.0E-02	ERR	8.0E-02	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–
48	Toluene	0	4	5.0E-02	ERR	5.0E-02	0.0E+00
49	Trichloroethylene	0	4	1.2E-01	ERR	1.2E-01	0.0E+00
50	Uranium	0	0	ERR	ERR	ERR	–
51	Xylenes	0	4	3.9E-01	ERR	3.9E-01	0.0E+00

DATA STATISTICS

DATE: 08/18/93
FILENA STAT-SW3.WQ1

EXPOSURE POINT: RIVER
MEDIUM: SURFACE WATER
UNITS: MG/L
U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC
1	Acenaphthene	0	4	2.9E-03	ERR	2.9E-03	0.0E+00
2	Acenaphthylene	0	4	2.6E-03	ERR	2.6E-03	0.0E+00
3	Aldrin	0	4	6.5E-03	ERR	3.3E-03	0.0E+00
4	Alpha-Chlordane	0	0	ERR	ERR	ERR	–
5	Alpha-Endosulfan	0	4	1.2E-02	ERR	5.8E-03	0.0E+00
6	Anthracene	0	4	2.6E-03	ERR	2.6E-03	0.0E+00
7	Benzene	0	4	5.0E-04	ERR	5.0E-04	0.0E+00
8	Benzo (a) anthracene	0	4	4.9E-03	ERR	4.9E-03	0.0E+00
9	Benzo (a) pyrene	0	4	7.0E-03	ERR	7.0E-03	0.0E+00
10	Benzo (b) fluoranthene	0	4	5.0E-03	ERR	5.0E-03	0.0E+00
11	Benzo (g,h,i) perylene	0	4	7.5E-03	ERR	7.5E-03	0.0E+00
12	Benzo (k) fluoranthene	0	4	5.0E-03	ERR	5.0E-03	0.0E+00
13	Beta-Endosulfan	0	4	2.1E-02	ERR	1.1E-02	0.0E+00
14	Boron	0	0	ERR	ERR	ERR	–
15	Cadmium (food, soil)	0	0	ERR	ERR	ERR	–
16	Cadmium (water)	0	4	3.4E-03	ERR	3.4E-03	0.0E+00
17	Chlordane	0	4	1.9E-02	ERR	9.3E-03	0.0E+00
18	Chromium	0	4	8.4E-03	ERR	8.4E-03	0.0E+00
19	Chrysene	0	4	3.7E-03	ERR	3.7E-03	0.0E+00
20	Cyanide	0	4	2.5E-03	ERR	2.5E-03	0.0E+00
21	DDD	0	4	9.0E-03	ERR	4.5E-03	0.0E+00
22	DDE	0	4	7.0E-03	ERR	3.5E-03	0.0E+00
23	DDT	0	4	9.0E-03	ERR	4.5E-03	0.0E+00
24	Dibenz (a,h) anthracene	0	4	6.0E-03	ERR	6.0E-03	0.0E+00
25	Dieldrin	0	4	1.3E-02	ERR	6.5E-03	0.0E+00
26	Dimethylbenzene, 1,3- /	3	4	2.9E-03	2.9E-03	1.8E-03	1.8E-03
27	Endrin	0	4	9.0E-03	ERR	4.5E-03	0.0E+00
28	Fluoranthene	0	4	1.2E-02	ERR	1.2E-02	0.0E+00
29	Fluorene	0	4	4.6E-03	ERR	4.6E-03	0.0E+00
30	Gamma-Chlordane	0	0	ERR	ERR	ERR	–
31	Gamma-Hexachlorocycl	1	4	3.6E-03	3.2E-06	1.8E-03	3.2E-06
32	Heptachlor	0	4	1.9E-02	ERR	9.5E-03	0.0E+00
33	Heptachlor epoxide	0	4	1.4E-02	ERR	7.0E-03	0.0E+00
34	Indeno (1,2,3-cd) pyrene	0	4	1.1E-02	ERR	1.1E-02	0.0E+00
35	Lead	0	4	2.2E-02	ERR	2.2E-02	0.0E+00
36	Mercury	0	4	5.0E-05	ERR	5.0E-05	0.0E+00
37	Naphthalene	0	4	2.5E-04	ERR	2.5E-04	0.0E+00
38	Nickel	0	4	1.6E-02	ERR	1.6E-02	0.0E+00
39	Nitrate	0	0	ERR	ERR	ERR	–
40	Nitrite	0	0	ERR	ERR	ERR	–
41	PCB 1260	0	2	8.8E-05	ERR	8.8E-05	0.0E+00
42	Phenanthrene	0	4	5.0E-03	ERR	5.0E-03	0.0E+00
43	Pyrene	0	4	8.5E-03	ERR	8.5E-03	0.0E+00
44	Silver	0	4	5.0E-03	ERR	5.0E-03	0.0E+00
45	Sulfide	0	0	ERR	ERR	ERR	–
46	Tetrachloroethene	0	4	5.0E-04	ERR	5.0E-04	0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–
48	Toluene	3	4	4.3E-03	4.3E-03	2.8E-03	2.8E-03
49	Trichloroethylene	3	4	2.6E-03	2.6E-03	2.0E-03	2.0E-03
50	Uranium	0	0	ERR	ERR	ERR	–
51	Xylenes	2	4	2.9E-03	2.9E-03	1.8E-03	1.8E-03

DATA STATISTICS

DATE: 08/18/93
FILENA STTF-SW2.WQ1

EXPOSURE POINT: RIVER - FISH
MEDIUM: SURFACE WATER
UNITS: MG/L
U MULTIPLIER: 0.5

	CHEMICAL	EPC HITS	EPC TOTAL	MAX VALUE	MAX HIT	ARITH MEAN	EPC	BCF	FISHEPC
1	Acenaphthene	0	9	2.9E-03	ERR	2.9E-03	0.0E+00		0.0E+00
2	Acenaphthylene	0	9	2.6E-03	ERR	2.6E-03	0.0E+00		0.0E+00
3	Aldrin	0	9	6.5E-03	ERR	1.4E-03	0.0E+00		0.0E+00
4	Alpha-Chlordane	0	0	ERR	ERR	ERR	–		0.0E+00
5	Alpha-Endosulfan	0	9	1.2E-02	ERR	2.6E-03	0.0E+00		0.0E+00
6	Anthracene	0	9	2.6E-03	ERR	2.6E-03	0.0E+00		0.0E+00
7	Benzene	0	9	5.0E-04	ERR	5.0E-04	0.0E+00		0.0E+00
8	Benzo (a) anthracene	0	9	4.9E-03	ERR	4.9E-03	0.0E+00		0.0E+00
9	Benzo (a) pyrene	0	9	7.0E-03	ERR	7.0E-03	0.0E+00		0.0E+00
10	Benzo (b) fluoranthene	0	9	5.0E-03	ERR	5.0E-03	0.0E+00		0.0E+00
11	Benzo (g,h,i) perylene	0	9	7.5E-03	ERR	7.5E-03	0.0E+00		0.0E+00
12	Benzo (k) fluoranthene	0	9	5.0E-03	ERR	5.0E-03	0.0E+00		0.0E+00
13	Beta-Endosulfan	0	9	2.1E-02	ERR	4.7E-03	0.0E+00		0.0E+00
14	Boron	0	0	ERR	ERR	ERR	–		0.0E+00
15	Cadmium (food, soil)	0	0	ERR	ERR	ERR	–		0.0E+00
16	Cadmium (water)	0	9	3.4E-03	ERR	3.4E-03	0.0E+00		0.0E+00
17	Chlordane	0	9	1.9E-02	ERR	4.1E-03	0.0E+00		0.0E+00
18	Chromium	1	9	1.9E-02	1.9E-02	9.6E-03	9.6E-03	1.6E+01	1.5E-01
19	Chrysene	0	9	3.7E-03	ERR	3.7E-03	0.0E+00		0.0E+00
20	Cyanide	0	9	2.5E-03	ERR	2.5E-03	0.0E+00		0.0E+00
21	DDD	0	9	9.0E-03	ERR	2.0E-03	0.0E+00		0.0E+00
22	DDE	0	9	7.0E-03	ERR	1.6E-03	0.0E+00		0.0E+00
23	DDT	0	9	9.0E-03	ERR	2.0E-03	0.0E+00		0.0E+00
24	Dibenz (a,h) anthracene	0	9	6.0E-03	ERR	6.0E-03	0.0E+00		0.0E+00
25	Dieldrin	0	9	1.3E-02	ERR	2.9E-03	0.0E+00		0.0E+00
26	Dimethylbenzene, 1,3- /	4	9	2.9E-03	2.9E-03	1.2E-03	1.2E-03	1.6E+01	1.8E-02
27	Endrin	0	9	9.0E-03	ERR	2.0E-03	0.0E+00		0.0E+00
28	Fluoranthene	0	9	1.2E-02	ERR	1.2E-02	0.0E+00		0.0E+00
29	Fluorene	0	9	4.6E-03	ERR	4.6E-03	0.0E+00		0.0E+00
30	Gamma-Chlordane	0	0	ERR	ERR	ERR	–		0.0E+00
31	Gamma-Hexachlorocycl	2	9	3.6E-03	3.7E-06	8.0E-04	3.7E-06		0.0E+00
32	Heptachlor	0	9	1.9E-02	ERR	4.2E-03	0.0E+00		0.0E+00
33	Heptachlor epoxide	0	9	1.4E-02	ERR	3.1E-03	0.0E+00		0.0E+00
34	Indeno (1,2,3-cd) pyrene	0	9	1.1E-02	ERR	1.1E-02	0.0E+00		0.0E+00
35	Lead	0	9	2.2E-02	ERR	2.2E-02	0.0E+00		0.0E+00
36	Mercury	0	9	5.0E-05	ERR	5.0E-05	0.0E+00		0.0E+00
37	Naphthalene	0	9	2.5E-04	ERR	2.5E-04	0.0E+00		0.0E+00
38	Nickel	0	9	1.6E-02	ERR	1.6E-02	0.0E+00		0.0E+00
39	Nitrate	0	0	ERR	ERR	ERR	–		0.0E+00
40	Nitrite	0	0	ERR	ERR	ERR	–		0.0E+00
41	PCB 1260	0	7	8.8E-05	ERR	8.8E-05	0.0E+00		0.0E+00
42	Phenanthrene	0	9	5.0E-03	ERR	5.0E-03	0.0E+00		0.0E+00
43	Pyrene	0	9	8.5E-03	ERR	8.5E-03	0.0E+00		0.0E+00
44	Silver	0	9	5.0E-03	ERR	5.0E-03	0.0E+00		0.0E+00
45	Sulfide	0	0	ERR	ERR	ERR	–		0.0E+00
46	Tetrachloroethene	0	9	5.0E-04	ERR	5.0E-04	0.0E+00		0.0E+00
47	Tetrazene	0	0	ERR	ERR	ERR	–		0.0E+00
48	Toluene	4	9	4.3E-03	4.3E-03	1.7E-03	1.7E-03	9.0E+01	1.5E-01
49	Trichloroethylene	7	9	2.6E-03	2.6E-03	2.0E-03	2.0E-03	3.9E+01	7.8E-02
50	Uranium	0	0	ERR	ERR	ERR	–		0.0E+00
51	Xylenes	2	9	2.9E-03	2.9E-03	1.3E-03	1.3E-03	2.3E+01	3.1E-02

P. Detailed Exposure/Risk Calculations - Chemicals

APPENDIX P

DETAILED EXPOSURE AND RISK CALCULATIONS (CHEMICALS)

USER'S GUIDE

The following pages provide detailed documentation of the exposure and risk calculations performed at this site. The following information may be helpful for those who wish to review these calculations in detail.

<u>Data Input</u>

Exposure and risk calculations are performed by providing data to the computer in three parts or worksheets. The first worksheet is named "POPSUM." This is where exposure scenarios to be evaluated are listed, grouped by population (populations are described in Section 6.0 of this report). This is also where all HIF terms developed in Section 6.0 are entered. Since not all of the populations to be evaluated fit into one POPSUM worksheet, multiple POPSUMs are created. Each POPSUM is identified by a separate disk number.

The second worksheet is named "CTV." This worksheet contains the names of all chemicals of concern and all available values for the following parameters:

RfDs = subchronic reference dose (route-specific)
RfDc = chronic reference dose (route-specific)
SF = slope factor (route-specific)
AFo = oral absorption fraction
ABS = absorption fraction from soil
P = dermal permeability (Kp) constant for water

The third worksheet is a series of exposure point concentration ("EPC") tables that record the concentrations of the chemicals of concern at each location. Since concentrations may change over time, three columns exist for each medium: subchronic (C_s), chronic (C_c) and lifetime (C_l) average values. If a chemical is assumed to remain constant over time, all of these values will be equal. These tables repeat the values already documented in Appendix O, so the EPC worksheets are not repeated here.

<u>Exposure and Risk Calculations</u>

Exposure and risk calculations for exposure scenarios and populations listed in "POPSUM" are performed in a series of worksheets (called "WS1," "WS2," etc.), grouped by population (POP1, POP2, etc., where POP1 = population 1 on the POPSUM worksheet). Each exposure and risk calculation worksheet is specific for a given population, exposure point, exposure medium and exposure route. All these terms are listed at the top of the page, along with the appropriate HIF values (copied from the POPSUM worksheet). Exposure and risk calculations are then presented in the body of the worksheet, grouped into three separate sections: subchronic, chronic and lifetime. Within each section, the first data column is for the exposure point concentration, copied from the appropriate EPC table. The next column is for the HIF values:

- HIFs = subchronic human intake factor
- HIFc = chronic human intake factor
- HIFl = lifetime (carcinogenic) human intake factor

Since the HIF value does not depend on chemical, the same value appears in all rows of the column. The next column is used for the chemical-specific ABS or P terms needed in any dermal exposure scenarios. Since these terms are not needed except in dermal scenarios, a value of 1 appears in this column for all oral or inhalation scenarios. The next column is the dose (intake), calculated by multiplying the exposure point concentration by the HIF. The

next column is the appropriate chemical, route and duration-specific CTV term (RfD_s, RfD_c and SF for subchronic, chronic and lifetime exposures, respectively). These are copied from the CTV worksheet mentioned above. The last column in each block is the risk estimate. For subchronic and chronic exposures, this is given by the dose (DI) divided by the RfD, and is termed the Hazard Quotient (HQ). For lifetime exposures, the value is the excess cancer risk, calculated from the equation

$$RISK = 1 - e^{-(DI_l \cdot SF)}$$

Summary Sheets

After all exposure scenarios that apply to a given population are evaluated, summary tables are prepared that tabulate the pathway-specific subchronic, chronic and lifetime dose and risk estimates for the population. These are copied from the preceding exposure and risk calculation worksheets. The doses are shown in the block on the left, and the risks or hazard quotients are shown in the block on the right. In each block, each column represents one exposure scenario (pathway). This is identified by the labels heading the column. Finally, risks are summed across chemicals and across pathways. These sums are shown just below the individual columns of risk estimates.

Arrangement of This Appendix

Provided below is an outline of how the exposure and risk summary tables are organized for the populations at this site, along with the page numbers where each section is located.

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RANGE NAME: POPSUM

EXPOSURE SCENARIOS EVALUATED
(GROUPED BY POPULATION)

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/19/93

POPULATION 1 — NO. OF SCENARIOS = 3

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	WORKSHEET NAME
1	FUTURE	RESIDENT 1	ZONE 1-NON EXC	SOIL (0-2')	ORAL	4.5E-06	3.0E-06	4.2E-07	WS1
2			ZONE 1-NON EXC	SOIL (0-2')	DERMAL	3.6E-05	3.4E-05	8.8E-06	WS2
3			ZONE 1-NON EXC	VEG (0-2')	ORAL	7.8E-04	6.6E-04	1.7E-04	WS3
4									WS4
5									WS5
6									WS6

POPULATION 2 — NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	RESIDENT 2	ZONE 2-NON EXC	SOIL (0-2')	ORAL	4.5E-06	3.0E-06	4.2E-07	WS1
2			ZONE 2-NON EXC	SOIL (0-2')	DERMAL	3.6E-05	3.4E-05	8.8E-06	WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 3 — NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	RESIDENT 3	ZONE 3-NON EXC	SOIL (0-2')	ORAL	4.5E-06	3.0E-06	4.2E-07	WS1
2			ZONE 3-NON EXC	SOIL (0-2')	DERMAL	3.6E-05	3.4E-05	8.8E-06	WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 4 — NO. OF SCENARIOS = 3

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	RESIDENT 4	ZONE 1-EXC	SOIL (0-12')	ORAL	4.5E-06	3.0E-06	4.2E-07	WS1
2			ZONE 1-EXC	SOIL (0-12')	DERMAL	3.6E-05	3.4E-05	8.8E-06	WS2
3			ZONE 1-EXC	VEG (0-12')	ORAL	7.8E-04	6.6E-04	1.7E-04	WS3
4									WS4
5									WS5
6									WS6

POPULATION 5 — NO. OF SCENARIOS = 3

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	RESIDENT 5	ZONE 4-EXC	SOIL (0-12')	ORAL	4.5E-06	3.0E-06	4.2E-07	WS1
2			ZONE 4-EXC	SOIL (0-12')	DERMAL	3.6E-05	3.4E-05	8.8E-06	WS2
3			ZONE 4-EXC	VEG (0-12')	ORAL	7.8E-04	6.6E-04	1.7E-04	WS3
4									WS4
5									WS5
6									WS6

POPULATION 6 NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	CONST. WORKER 1	ZONE 1-EXC	SOIL (0-12')	ORAL	3.4E-07		4.8E-09	WS1
2			ZONE 1-EXC	DUST (PM10)	INHALATION	1.4E-02		2.0E-04	WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 7 NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	CONST. WORKER 2	ZONE 4-EXC	SOIL (0-12')	ORAL	3.4E-07		4.8E-09	WS1
2			ZONE 4-EXC	DUST (PM10)	INHALATION	1.4E-02		2.0E-04	WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 8 NO. OF SCENARIOS = 1

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	COMM. WORKER 1	ZONE 1-NON EXC	SOIL (0-2')	ORAL		4.9E-07	1.7E-07	WS1
2									WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 9 NO. OF SCENARIOS = 1

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	COMM. WORKER 2	ZONE 2-NON EXC	SOIL (0-2')	ORAL		4.9E-07	1.7E-07	WS1
2									WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 10 NO. OF SCENARIOS = 1

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	COMM. WORKER 3	ZONE 3-NON EXC	SOIL (0-2')	ORAL		4.9E-07	1.7E-07	WS1
2									WS2
3									WS3
4									WS4
5									WS5
6									WS6

RANGE NAME: CTV

LIST OF CHEMICALS OF CONCERN
WITH CTVs AND OTHER CHEMICAL-SPECIFIC DATA

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		ORAL				INHALATION			DERMAL(a)				
NO.	CHEMICAL NAME	RfDs	RfDc	SF	AFo	RfDs	RfDc	SF	RfDs	RfDc	SF	ABS	P
1	Acenaphthene	6.00E-01	6.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.52E-01
2	Acenaphthylene	4.00E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.69E-01
3	Aldrin	3.0E-05	3.0E-05	1.7E+01	1.0E+00	NA	NA	1.7E+01	3.0E-05	3.0E-05	1.7E+01	1.0E-02	1.60E-03
4	Alpha-chlordan	6.0E-05	6.0E-05	1.3E+00	8E-01	NA	NA	1.3E+00	4.8E-05	4.8E-05	1.6E+00	1.0E-02	4.60E-02
5	Alpha-endosulf	2.0E-04	5.0E-05	NA	1.0E+00	NA	NA	NA	2.0E-04	5.0E-05	NA	1.0E-02	2.09E-03
6	Anthracene	3.0E+00	3.0E-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.26E-01
7	Benzene	5.0E-02	5.0E-03	2.9E-02	1.0E+00	9.1E-03	NA	2.9E-02	5.0E-02	5.0E-03	2.9E-02	8.0E-02	1.1E-01
8	Benzo(a)anthra	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	8.10E-01
9	Benzo(a)pyrene	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.20E+00
10	Benzo(b)fluora	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.20E+00
11	Benzo(g,h,i)pe	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.65E+00
12	Benzo(k)fluora	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.11E+00
13	Beta-endosulfa	2.0E-04	5.0E-05	NA	1.0E+00	NA	NA	NA	2.0E-04	5.0E-05	NA	1.0E-02	2.09E-03
14	Boron	9.0E-02	9.0E-02	NA	1E+00	5.7E-03	5.7E-03	NA	9.0E-02	9.0E-02	NA	1.0E-03	1.00E-03
15	Cadmium (food	NA	1.0E-03	NA	3E-02	NA	NA	6.1E+00	NA	2.5E-05	NA	1.0E-02	NA
16	Cadmium (wate	NA	5.0E-04	NA	5E-02	NA	NA	NA	NA	2.5E-05	NA	NA	1.00E-03
17	Chlordane	6.0E-05	6.0E-05	1.3E+00	1.0E+00	NA	NA	1.3E+00	6.0E-05	6.0E-05	1.3E+00	1.0E-02	5.20E-02
18	Chromium (VI)	2.0E-02	5.0E-03	NA	5E-02	NA	NA	4.2E+01	1.0E-03	2.5E-04	NA	NA	1.00E-03
19	Chrysene	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	8.10E-01
20	Cyanide (free)	2.0E-02	2.0E-02	NA	1E+00	2.9E-04	2.0E-03	NA	2.0E-02	2.0E-02	NA	3.0E-02	1.00E-03
21	DDD, 4,4'-	NA	NA	2.4E-01	1E+00	NA	NA	NA	NA	NA	2.4E-01	1.0E-02	2.80E-01
22	DDE, 4,4'-	NA	NA	3.4E-01	1E+00	NA	NA	NA	NA	NA	3.4E-01	1.0E-02	2.40E-01
23	DDT, 4,4'-	5.0E-04	5.0E-04	3.4E-01	1E+00	NA	NA	3.4E-01	5.0E-04	5.0E-04	3.4E-01	1.0E-02	4.30E-01
24	Dibenz(a,h)ant	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	2.70E+00
25	Dieldrin	5.0E-05	5.0E-05	1.6E+01	1E+00	NA	NA	1.6E+01	5.0E-05	5.0E-05	1.6E+01	1.0E-02	1.60E-02
26	Dimethylbenzen	4.0E+00	2.0E+00	NA	1E+00	NA	NA	NA	4.0E+00	2.0E+00	NA	1.2E-01	8.9E-02
27	Endrin	3.0E-04	3.0E-04	NA	1.0E+00	NA	NA	NA	3.0E-04	3.0E-04	NA	1.0E-02	1.60E-02
28	Fluoranthene	4.0E-01	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.60E-01
29	Fluorene	4.0E-01	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.58E-01
30	Gamma-chlordan	6.0E-05	6.0E-05	1.3E+00	8E-01	NA	NA	1.3E+00	4.8E-05	4.8E-05	1.6E+00	1.0E-02	5.20E-02
31	Gamma-hexachlo	3.0E-03	3.0E-04	1.3E+00	1E+00	NA	NA	NA	3.0E-03	3.0E-04	1.3E+00	1.0E-02	1.40E-01
32	Heptachlor	5.0E-04	5.0E-04	4.5E+00	1E+00	NA	NA	4.5E+00	5.0E-04	5.0E-04	4.5E+00	1.0E-02	1.10E-02
33	Heptachlor epo	1.3E-05	1.3E-05	9.1E+00	1E+00	NA	NA	9.1E+00	1.3E-05	1.3E-05	9.1E+00	1.0E-02	6.67E-04
34	Indeno(1,2,3-c	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.90E+00
35	Lead	NA	NA	NA	2E-01	NA	NA	NA	NA	NA	NA	6.0E-03	1.00E-03
36	Mercury, inorg	3.0E-04	3.0E-04	NA	2E-02	NA	NA	NA	6.0E-06	6.0E-06	NA	1.0E-03	1.00E-03
37	Naphthalene	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.90E-02
38	Nickel	2.0E-02	2.0E-02	NA	5E-02	NA	NA	8.4E-01	1.0E-03	1.0E-03	NA	NA	NA
39	Nitrate	1.6E+00	1.6E+00	NA	1E+00	NA	NA	NA	1.6E+00	1.6E+00	NA	1.0E-03	1.00E-03
40	Nitrite	1.0E-01	1.0E-01	NA	1E+00	NA	NA	NA	1.0E-01	1.0E-01	NA	1.0E-03	1.00E-03
41	PCB 1260	7.0E-05	7.0E-05	7.7E+00	1E+00	NA	NA	NA	6.7E-05	6.7E-05	8.1E+00	6.0E-02	3.69E-01
42	Phenanthrene	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.30E-01
43	Pyrene	3.0E-01	3.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.26E-01
44	Silver	5.0E-03	5.0E-03	NA	5E-02	NA	NA	NA	2.5E-04	2.5E-04	NA	1.0E-02	1.00E-03
45	Sulfide	NA	NA	NA	1E+00	NA	NA	NA	NA	NA	NA	1.0E-03	1.00E-03
46	Tetrachloroeth	1.0E-01	1.0E-02	5.2E-02	1.0E+00	NA	NA	2.0E-03	1.0E-01	1.0E-02	5.2E-02	1.0E-01	3.7E-01
47	Tetrazene	NA	NA	NA	1E+00	NA	NA	NA	NA	NA	NA	1.0E-02	
48	Toluene	2.0E+00	2.0E-01	NA	1.0E+00	5.7E-01	1.1E-01	NA	2.0E+00	2.0E-01	NA	1.2E-01	1.0E+00
49	Trichloroethen	2.0E-02	2.0E-03	1.1E-02	1.0E+00	NA	NA	6.0E-03	2.0E-02	2.0E-03	1.1E-02	1.0E-01	2.3E-01
50	Uranium (solub	NA	3.0E-03	NA	5.0E-02	NA	NA	NA	NA	1.5E-04	NA	1.00E-03	1.00E-03

51	Xylenes (total	4.0E+00	2.0E+00	NA	1E+00	NA	NA	NA	4.0E+00	2.0E+00	NA	1.2E-01	8.9E-02

RANGE NAME: EPC1

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 1-NON EXC

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-2')			MEDIUM 2 VEG (0-2')			MEDIUM 3 0			MEDIUM 4 0			MEDIUM 5 0		
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	11S	11C	11L	12S	12C	12L	13S	13C	13L	14S	14C	14L	15S	15C	15L
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
3	Aldrin	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
4	Alpha-chlordan	1.3E-01	1.3E-01	1.3E-01	1.1E-02	1.1E-02	1.1E-02									
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
6	Anthracene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
8	Benzo(a)anthra	3.7E-01	3.7E-01	3.7E-01	3.3E-02	3.3E-02	3.3E-02									
9	Benzo(a)pyrene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
10	Benzo(b)fluora	5.0E-01	5.0E-01	5.0E-01	5.7E-02	5.7E-02	5.7E-02									
11	Benzo(g,h,i)pe	5.0E-01	5.0E-01	5.0E-01	9.4E-02	9.4E-02	9.4E-02									
12	Benzo(k)fluora	4.6E-01	4.6E-01	4.6E-01	7.7E-02	7.7E-02	7.7E-02									
13	Beta-endosulfa	3.3E-03	3.3E-03	3.3E-03	1.1E-04	1.1E-04	1.1E-04									
14	Boron	--	--	--	0.0E+00	0.0E+00	0.0E+00									
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
16	Cadmium (wate	--	--	--	NA	NA	NA									
17	Chlordane	1.7E-01	1.7E-01	1.7E-01	1.4E-02	1.4E-02	1.4E-02									
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
19	Chrysene	2.8E-01	2.8E-01	2.8E-01	2.5E-02	2.5E-02	2.5E-02									
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA									
21	DDD, 4,4'-	2.6E-02	2.6E-02	2.6E-02	2.5E-03	2.5E-03	2.5E-03									
22	DDE, 4,4'-	8.3E-02	8.3E-02	8.3E-02	7.6E-03	7.6E-03	7.6E-03									
23	DDT, 4,4'-	9.0E-02	9.0E-02	9.0E-02	1.2E-02	1.2E-02	1.2E-02									
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
25	Dieldrin	2.7E-02	2.7E-02	2.7E-02	1.4E-03	1.4E-03	1.4E-03									
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
27	Endrin	4.6E-02	4.6E-02	4.6E-02	2.4E-03	2.4E-03	2.4E-03									
28	Fluoranthene	7.8E-01	7.8E-01	7.8E-01	4.9E-02	4.9E-02	4.9E-02									
29	Fluorene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
32	Heptachlor	3.1E-03	3.1E-03	3.1E-03	1.4E-04	1.4E-04	1.4E-04									
33	Heptachlor epo	1.7E-02	1.7E-02	1.7E-02	1.3E-03	1.3E-03	1.3E-03									
34	Indeno(1,2,3-c	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
35	Lead	6.8E+01	6.8E+01	6.8E+01	6.8E-02	6.8E-02	6.8E-02									
36	Mercury, inorg	1.1E-01	1.1E-01	1.1E-01	2.3E-03	2.3E-03	2.3E-03									
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
38	Nickel	2.8E+01	2.8E+01	2.8E+01	1.4E-01	1.4E-01	1.4E-01									
39	Nitrate	--	--	--	0.0E+00	0.0E+00	0.0E+00									
40	Nitrite	--	--	--	0.0E+00	0.0E+00	0.0E+00									
41	PCB 1260	1.5E-01	1.5E-01	1.5E-01	2.7E-02	2.7E-02	2.7E-02									
42	Phenanthrene	5.3E-01	5.3E-01	5.3E-01	2.7E-02	2.7E-02	2.7E-02									
43	Pyrene	9.2E-01	9.2E-01	9.2E-01	5.6E-02	5.6E-02	5.6E-02									
44	Silver	4.5E-02	4.5E-02	4.5E-02	4.7E-04	4.7E-04	4.7E-04									
45	Sulfide	--	--	--	0.0E+00	0.0E+00	0.0E+00									
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
47	Tetrazene	--	--	--	NA	NA	NA									
48	Toluene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
50	Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00									

RANGE NAME: EPC2

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 2-NON EXC

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-2')			MEDIUM 2	0		MEDIUM 3	0		MEDIUM 4	0		MEDIUM 5	0	
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	21S	21C	21L	22S	22C	22L	23S	23C	23L	24S	24C	24L	25S	25C	25L
1	Acenaphthene	3.2E-01	3.2E-01	3.2E-01												
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00												
3	Aldrin	5.1E-02	5.1E-02	5.1E-02												
4	Alpha-chlordan	3.8E-01	3.8E-01	3.8E-01												
5	Alpha-endosulf	6.0E-03	6.0E-03	6.0E-03												
6	Anthracene	8.6E-01	8.6E-01	8.6E-01												
7	Benzene	4.7E-02	4.7E-02	4.7E-02												
8	Benzo(a)anthra	1.7E+00	1.7E+00	1.7E+00												
9	Benzo(a)pyrene	1.8E+00	1.8E+00	1.8E+00												
10	Benzo(b)fluora	1.9E+00	1.9E+00	1.9E+00												
11	Benzo(g,h,i)pe	1.7E+00	1.7E+00	1.7E+00												
12	Benzo(k)fluora	1.7E+00	1.7E+00	1.7E+00												
13	Beta-endosulfa	4.7E-02	4.7E-02	4.7E-02												
14	Boron	0.0E+00	0.0E+00	0.0E+00												
15	Cadmium (food	9.7E-01	9.7E-01	9.7E-01												
16	Cadmium (wate	--	--	--												
17	Chlordane	8.3E-01	8.3E-01	8.3E-01												
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00												
19	Chrysene	1.2E+00	1.2E+00	1.2E+00												
20	Cyanide (free)	6.7E-01	6.7E-01	6.7E-01												
21	DDD, 4,4'-	1.2E-01	1.2E-01	1.2E-01												
22	DDE, 4,4'-	2.2E-01	2.2E-01	2.2E-01												
23	DDT, 4,4'-	2.7E-01	2.7E-01	2.7E-01												
24	Dibenz(a,h)ant	3.8E-01	3.8E-01	3.8E-01												
25	Dieldrin	1.8E-01	1.8E-01	1.8E-01												
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00												
27	Endrin	1.6E-01	1.6E-01	1.6E-01												
28	Fluoranthene	2.1E+00	2.1E+00	2.1E+00												
29	Fluorene	0.0E+00	0.0E+00	0.0E+00												
30	Gamma-chlordan	4.0E-01	4.0E-01	4.0E-01												
31	Gamma-hexachlo	1.3E-02	1.3E-02	1.3E-02												
32	Heptachlor	2.9E-02	2.9E-02	2.9E-02												
33	Heptachlor epo	9.2E-02	9.2E-02	9.2E-02												
34	Indeno(1,2,3-c	2.3E+00	2.3E+00	2.3E+00												
35	Lead	3.9E+02	3.9E+02	3.9E+02												
36	Mercury, inorg	2.8E-01	2.8E-01	2.8E-01												
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00												
38	Nickel	3.4E+01	3.4E+01	3.4E+01												
39	Nitrate	--	--	--												
40	Nitrite	5.3E+00	5.3E+00	5.3E+00												
41	PCB 1260	3.0E-01	3.0E-01	3.0E-01												
42	Phenanthrene	2.7E+00	2.7E+00	2.7E+00												
43	Pyrene	2.7E+00	2.7E+00	2.7E+00												
44	Silver	7.7E-01	7.7E-01	7.7E-01												
45	Sulfide	2.8E+02	2.8E+02	2.8E+02												
46	Tetrachloroeth	2.0E-03	2.0E-03	2.0E-03												
47	Tetrazene	--	--	--												
48	Toluene	4.5E-02	4.5E-02	4.5E-02												
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00												
50	Uranium (solub	0.0E+00	0.0E+00	0.0E+00												
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00												

RANGE NAME: EPC3

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 3-NON EXC

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-2')			MEDIUM 2 0			MEDIUM 3 0			MEDIUM 4 0			MEDIUM 5 0		
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	31S	31C	31L	32S	32C	32L	33S	33C	33L	34S	34C	34L	35S	35C	35L
1	Acenaphthene	3.6E-01	3.6E-01	3.6E-01												
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00												
3	Aldrin	3.9E-03	3.9E-03	3.9E-03												
4	Alpha-chlordan	2.5E-02	2.5E-02	2.5E-02												
5	Alpha-endosulf	5.7E-03	5.7E-03	5.7E-03												
6	Anthracene	1.1E+00	1.1E+00	1.1E+00												
7	Benzene	0.0E+00	0.0E+00	0.0E+00												
8	Benzo(a)anthra	2.2E+00	2.2E+00	2.2E+00												
9	Benzo(a)pyrene	2.6E+00	2.6E+00	2.6E+00												
10	Benzo(b)fluora	3.0E+00	3.0E+00	3.0E+00												
11	Benzo(g,h,i)pe	1.9E+00	1.9E+00	1.9E+00												
12	Benzo(k)fluora	2.3E+00	2.3E+00	2.3E+00												
13	Beta-endosulfa	1.3E-01	1.3E-01	1.3E-01												
14	Boron	--	--	--												
15	Cadmium (food	2.8E+00	2.8E+00	2.8E+00												
16	Cadmium (wate	--	--	--												
17	Chlordane	5.2E-01	5.2E-01	5.2E-01												
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00												
19	Chrysene	2.3E+00	2.3E+00	2.3E+00												
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00												
21	DDD, 4,4'-	2.9E-02	2.9E-02	2.9E-02												
22	DDE, 4,4'-	4.0E-02	4.0E-02	4.0E-02												
23	DDT, 4,4'-	1.4E-01	1.4E-01	1.4E-01												
24	Dibenz(a,h)ant	2.9E-01	2.9E-01	2.9E-01												
25	Dieldrin	2.0E-02	2.0E-02	2.0E-02												
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00												
27	Endrin	7.5E-02	7.5E-02	7.5E-02												
28	Fluoranthene	3.0E+00	3.0E+00	3.0E+00												
29	Fluorene	0.0E+00	0.0E+00	0.0E+00												
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00												
31	Gamma-hexachlo	8.8E-03	8.8E-03	8.8E-03												
32	Heptachlor	4.5E-03	4.5E-03	4.5E-03												
33	Heptachlor epo	1.2E-02	1.2E-02	1.2E-02												
34	Indeno(1,2,3-c	2.9E+00	2.9E+00	2.9E+00												
35	Lead	2.9E+02	2.9E+02	2.9E+02												
36	Mercury, inorg	3.5E-01	3.5E-01	3.5E-01												
37	Naphthalene	9.6E-01	9.6E-01	9.6E-01												
38	Nickel	9.9E+01	9.9E+01	9.9E+01												
39	Nitrate	--	--	--												
40	Nitrite	--	--	--												
41	PCB 1260	1.4E-01	1.4E-01	1.4E-01												
42	Phenanthrene	4.3E+00	4.3E+00	4.3E+00												
43	Pyrene	3.8E+00	3.8E+00	3.8E+00												
44	Silver	4.3E+00	4.3E+00	4.3E+00												
45	Sulfide	1.1E+02	1.1E+02	1.1E+02												
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00												
47	Tetrazene	0.0E+00	0.0E+00	0.0E+00												
48	Toluene	0.0E+00	0.0E+00	0.0E+00												
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00												
50	Uranium (solub	--	--	--												
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00												

RANGE NAME: EPC4

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 1-EXC

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-12')			MEDIUM 2 VEG (0-12')			MEDIUM 3 DUST (PM10) PM10 = 5.0E-06			MEDIUM 4 0			MEDIUM 5 0		
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	41S	41C	41L	42S	42C	42L	43S	43C	43L	44S	44C	44L	45S	45C	45L
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
3	Aldrin	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
4	Alpha-chlordan	1.3E-01	1.3E-01	1.3E-01	1.1E-02	1.1E-02	1.1E-02	6.6E-07	6.6E-07	6.6E-07						
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
6	Anthracene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
8	Benzo(a)anthra	3.2E-01	3.2E-01	3.2E-01	2.8E-02	2.8E-02	2.8E-02	1.6E-06	1.6E-06	1.6E-06						
9	Benzo(a)pyrene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
10	Benzo(b)fluora	3.9E-01	3.9E-01	3.9E-01	4.4E-02	4.4E-02	4.4E-02	1.9E-06	1.9E-06	1.9E-06						
11	Benzo(g,h,i)pe	3.6E-01	3.6E-01	3.6E-01	6.9E-02	6.9E-02	6.9E-02	1.8E-06	1.8E-06	1.8E-06						
12	Benzo(k)fluora	3.3E-01	3.3E-01	3.3E-01	5.5E-02	5.5E-02	5.5E-02	1.7E-06	1.7E-06	1.7E-06						
13	Beta-endosulfa	3.3E-03	3.3E-03	3.3E-03	1.1E-04	1.1E-04	1.1E-04	1.7E-08	1.7E-08	1.7E-08						
14	Boron	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
16	Cadmium (wate	--	--	--	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00						
17	Chlordane	1.3E-01	1.3E-01	1.3E-01	1.1E-02	1.1E-02	1.1E-02	6.6E-07	6.6E-07	6.6E-07						
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
19	Chrysene	2.4E-01	2.4E-01	2.4E-01	2.1E-02	2.1E-02	2.1E-02	1.2E-06	1.2E-06	1.2E-06						
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00						
21	DDD, 4,4'-	2.0E-02	2.0E-02	2.0E-02	1.9E-03	1.9E-03	1.9E-03	1.0E-07	1.0E-07	1.0E-07						
22	DDE, 4,4'-	6.2E-02	6.2E-02	6.2E-02	5.7E-03	5.7E-03	5.7E-03	3.1E-07	3.1E-07	3.1E-07						
23	DDT, 4,4'-	6.5E-02	6.5E-02	6.5E-02	8.4E-03	8.4E-03	8.4E-03	3.2E-07	3.2E-07	3.2E-07						
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
25	Dieldrin	2.7E-02	2.7E-02	2.7E-02	1.4E-03	1.4E-03	1.4E-03	1.3E-07	1.3E-07	1.3E-07						
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
27	Endrin	3.5E-02	3.5E-02	3.5E-02	1.8E-03	1.8E-03	1.8E-03	1.8E-07	1.8E-07	1.8E-07						
28	Fluoranthene	6.3E-01	6.3E-01	6.3E-01	3.9E-02	3.9E-02	3.9E-02	3.2E-06	3.2E-06	3.2E-06						
29	Fluorene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
32	Heptachlor	3.1E-03	3.1E-03	3.1E-03	1.4E-04	1.4E-04	1.4E-04	1.5E-08	1.5E-08	1.5E-08						
33	Heptachlor epo	1.7E-02	1.7E-02	1.7E-02	1.3E-03	1.3E-03	1.3E-03	8.6E-08	8.6E-08	8.6E-08						
34	Indeno(1,2,3-c	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
35	Lead	6.4E+01	6.4E+01	6.4E+01	6.5E-02	6.5E-02	6.5E-02	3.2E-04	3.2E-04	3.2E-04						
36	Mercury, inorg	9.6E-02	9.6E-02	9.6E-02	2.1E-03	2.1E-03	2.1E-03	4.8E-07	4.8E-07	4.8E-07						
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
38	Nickel	2.4E+01	2.4E+01	2.4E+01	1.2E-01	1.2E-01	1.2E-01	1.2E-04	1.2E-04	1.2E-04						
39	Nitrate	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
40	Nitrite	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
41	PCB 1260	1.2E-01	1.2E-01	1.2E-01	2.0E-02	2.0E-02	2.0E-02	5.9E-07	5.9E-07	5.9E-07						
42	Phenanthrene	4.5E-01	4.5E-01	4.5E-01	2.4E-02	2.4E-02	2.4E-02	2.3E-06	2.3E-06	2.3E-06						
43	Pyrene	7.5E-01	7.5E-01	7.5E-01	4.5E-02	4.5E-02	4.5E-02	3.7E-06	3.7E-06	3.7E-06						
44	Silver	4.5E-02	4.5E-02	4.5E-02	4.7E-04	4.7E-04	4.7E-04	2.3E-07	2.3E-07	2.3E-07						
45	Sulfide	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
47	Tetrazene	--	--	--	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00						
48	Toluene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
50	Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						

RANGE NAME: EPC5

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 4-EXC

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-12')			MEDIUM 2 VEG (0-12')			MEDIUM 3 DUST (PM10) PM10 = 5.0E-06			MEDIUM 4 0			MEDIUM 5 0		
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	51S	51C	51L	52S	52C	52L	53S	53C	53L	54S	54C	54L	55S	55C	55L
1	Acenaphthene	4.3E-01	4.3E-01	4.3E-01	1.7E-02	1.7E-02	1.7E-02	2.2E-06	2.2E-06	2.2E-06						
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
3	Aldrin	7.6E-03	7.6E-03	7.6E-03	2.3E-04	2.3E-04	2.3E-04	3.8E-08	3.8E-08	3.8E-08						
4	Alpha-chlordan	2.9E-02	2.9E-02	2.9E-02	2.5E-03	2.5E-03	2.5E-03	1.5E-07	1.5E-07	1.5E-07						
5	Alpha-endosulf	6.8E-03	6.8E-03	6.8E-03	2.3E-04	2.3E-04	2.3E-04	3.4E-08	3.4E-08	3.4E-08						
6	Anthracene	1.1E+00	1.1E+00	1.1E+00	5.8E-02	5.8E-02	5.8E-02	5.6E-06	5.6E-06	5.6E-06						
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
8	Benzo(a)anthra	7.8E-01	7.8E-01	7.8E-01	7.0E-02	7.0E-02	7.0E-02	3.9E-06	3.9E-06	3.9E-06						
9	Benzo(a)pyrene	9.4E-01	9.4E-01	9.4E-01	1.1E-01	1.1E-01	1.1E-01	4.7E-06	4.7E-06	4.7E-06						
10	Benzo(b)fluora	6.6E-01	6.6E-01	6.6E-01	7.5E-02	7.5E-02	7.5E-02	3.3E-06	3.3E-06	3.3E-06						
11	Benzo(g,h,i)pe	5.6E-01	5.6E-01	5.6E-01	1.1E-01	1.1E-01	1.1E-01	2.8E-06	2.8E-06	2.8E-06						
12	Benzo(k)fluora	5.9E-01	5.9E-01	5.9E-01	9.9E-02	9.9E-02	9.9E-02	3.0E-06	3.0E-06	3.0E-06						
13	Beta-endosulfa	6.3E-03	6.3E-03	6.3E-03	2.1E-04	2.1E-04	2.1E-04	3.1E-08	3.1E-08	3.1E-08						
14	Boron	1.1E+01	1.1E+01	1.1E+01	1.9E+00	1.9E+00	1.9E+00	5.3E-05	5.3E-05	5.3E-05						
15	Cadmium (food	6.9E-01	6.9E-01	6.9E-01	1.1E-02	1.1E-02	1.1E-02	3.4E-06	3.4E-06	3.4E-06						
16	Cadmium (wate	--	--	--	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00						
17	Chlordane	9.9E-01	9.9E-01	9.9E-01	8.4E-02	8.4E-02	8.4E-02	5.0E-06	5.0E-06	5.0E-06						
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
19	Chrysene	9.9E-01	9.9E-01	9.9E-01	8.9E-02	8.9E-02	8.9E-02	5.0E-06	5.0E-06	5.0E-06						
20	Cyanide (free)	3.2E-01	3.2E-01	3.2E-01	NA	NA	NA	1.6E-06	1.6E-06	1.6E-06						
21	DDD, 4,4'-	1.2E-01	1.2E-01	1.2E-01	1.2E-02	1.2E-02	1.2E-02	6.2E-07	6.2E-07	6.2E-07						
22	DDE, 4,4'-	2.4E-01	2.4E-01	2.4E-01	2.2E-02	2.2E-02	2.2E-02	1.2E-06	1.2E-06	1.2E-06						
23	DDT, 4,4'-	6.2E-01	6.2E-01	6.2E-01	8.0E-02	8.0E-02	8.0E-02	3.1E-06	3.1E-06	3.1E-06						
24	Dibenz(a,h)ant	2.3E-01	2.3E-01	2.3E-01	3.8E-02	3.8E-02	3.8E-02	1.1E-06	1.1E-06	1.1E-06						
25	Dieldrin	2.2E-02	2.2E-02	2.2E-02	1.2E-03	1.2E-03	1.2E-03	1.1E-07	1.1E-07	1.1E-07						
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
27	Endrin	3.0E-01	3.0E-01	3.0E-01	1.5E-02	1.5E-02	1.5E-02	1.5E-06	1.5E-06	1.5E-06						
28	Fluoranthene	1.6E+00	1.6E+00	1.6E+00	1.0E-01	1.0E-01	1.0E-01	8.1E-06	8.1E-06	8.1E-06						
29	Fluorene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
30	Gamma-chlordan	3.2E-02	3.2E-02	3.2E-02	2.7E-03	2.7E-03	2.7E-03	1.6E-07	1.6E-07	1.6E-07						
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
33	Heptachlor epo	6.3E-02	6.3E-02	6.3E-02	4.9E-03	4.9E-03	4.9E-03	3.1E-07	3.1E-07	3.1E-07						
34	Indeno(1,2,3-c	3.2E-01	3.2E-01	3.2E-01	4.7E-02	4.7E-02	4.7E-02	1.6E-06	1.6E-06	1.6E-06						
35	Lead	1.7E+02	1.7E+02	1.7E+02	1.7E-01	1.7E-01	1.7E-01	8.3E-04	8.3E-04	8.3E-04						
36	Mercury, inorg	1.9E-01	1.9E-01	1.9E-01	4.1E-03	4.1E-03	4.1E-03	9.4E-07	9.4E-07	9.4E-07						
37	Naphthalene	5.5E-01	5.5E-01	5.5E-01	1.8E-02	1.8E-02	1.8E-02	2.8E-06	2.8E-06	2.8E-06						
38	Nickel	1.7E+01	1.7E+01	1.7E+01	8.5E-02	8.5E-02	8.5E-02	8.7E-05	8.7E-05	8.7E-05						
39	Nitrate	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
40	Nitrite	5.7E+00	5.7E+00	5.7E+00	1.4E+01	1.4E+01	1.4E+01	2.8E-05	2.8E-05	2.8E-05						
41	PCB 1260	4.4E-01	4.4E-01	4.4E-01	7.6E-02	7.6E-02	7.6E-02	2.2E-06	2.2E-06	2.2E-06						
42	Phenanthrene	4.6E-01	4.6E-01	4.6E-01	2.4E-02	2.4E-02	2.4E-02	2.3E-06	2.3E-06	2.3E-06						
43	Pyrene	2.2E+00	2.2E+00	2.2E+00	1.4E-01	1.4E-01	1.4E-01	1.1E-05	1.1E-05	1.1E-05						
44	Silver	5.5E-02	5.5E-02	5.5E-02	5.7E-04	5.7E-04	5.7E-04	2.8E-07	2.8E-07	2.8E-07						
45	Sulfide	2.6E+02	2.6E+02	2.6E+02	3.2E+01	3.2E+01	3.2E+01	1.3E-03	1.3E-03	1.3E-03						
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
47	Tetrazene	1.0E+00	1.0E+00	1.0E+00	NA	NA	NA	5.1E-06	5.1E-06	5.1E-06						
48	Toluene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
50	Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00						

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: RESIDENT 1

EXPOSURE POINT: ZONE 1-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 4.5E-06
HIFc = 3.0E-06
HIFl = 4.2E-07

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	4.5E-06	1	0.0E+00	6.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	6.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	4.5E-06	1	0.0E+00	3.0E-05	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.3E-01	4.5E-06	1	5.9E-07	6.0E-05	1E-02	1.3E-01	3.0E-06	1	4.0E-07	6.0E-05	7E-03	1.3E-01	4.2E-07	1	5.5E-08	1.3E+00	7E-08
5	Alpha-endosulf	0.0E+00	4.5E-06	1	0.0E+00	2.0E-04	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	4.5E-06	1	0.0E+00	3.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	4.5E-06	1	0.0E+00	5.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.7E-01	4.5E-06	1	1.7E-06	4.0E-02	4E-05	3.7E-01	3.0E-06	1	1.1E-06	4.0E-02	3E-05	3.7E-01	4.2E-07	1	1.6E-07	7.3E+00	1E-06
9	Benzo(a)pyrene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	5.0E-01	4.5E-06	1	2.3E-06	4.0E-02	6E-05	5.0E-01	3.0E-06	1	1.5E-06	4.0E-02	4E-05	5.0E-01	4.2E-07	1	2.1E-07	7.3E+00	2E-06
11	Benzo(g,h,i)pe	5.0E-01	4.5E-06	1	2.2E-06	4.0E-02	6E-05	5.0E-01	3.0E-06	1	1.5E-06	4.0E-02	4E-05	5.0E-01	4.2E-07	1	2.1E-07	NA	NA
12	Benzo(k)fluora	4.6E-01	4.5E-06	1	2.1E-06	4.0E-02	5E-05	4.6E-01	3.0E-06	1	1.4E-06	4.0E-02	3E-05	4.6E-01	4.2E-07	1	1.9E-07	7.3E+00	1E-06
13	Beta-endosulfa	3.3E-03	4.5E-06	1	1.5E-08	2.0E-04	7E-05	3.3E-03	3.0E-06	1	1.0E-08	5.0E-05	2E-04	3.3E-03	4.2E-07	1	1.4E-09	NA	NA
14	Boron	--	4.5E-06	1	0.0E+00	9.0E-02	0E+00	--	3.0E-06	1	0.0E+00	9.0E-02	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	1.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
16	Cadmium (wate	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	5.0E-04	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
17	Chlordane	1.7E-01	4.5E-06	1	7.7E-07	6.0E-05	1E-02	1.7E-01	3.0E-06	1	5.1E-07	6.0E-05	9E-03	1.7E-01	4.2E-07	1	7.2E-08	1.3E+00	9E-08
18	Chromium (VI)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
19	Chrysene	2.8E-01	4.5E-06	1	1.2E-06	4.0E-02	3E-05	2.8E-01	3.0E-06	1	8.3E-07	4.0E-02	2E-05	2.8E-01	4.2E-07	1	1.2E-07	7.3E+00	9E-07
20	Cyanide (free)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
21	DDD, 4,4'-	2.6E-02	4.5E-06	1	1.2E-07	NA	NA	2.6E-02	3.0E-06	1	7.9E-08	NA	NA	2.6E-02	4.2E-07	1	1.1E-08	2.4E-01	3E-09
22	DDE, 4,4'-	8.3E-02	4.5E-06	1	3.7E-07	NA	NA	8.3E-02	3.0E-06	1	2.5E-07	NA	NA	8.3E-02	4.2E-07	1	3.5E-08	3.4E-01	1E-08
23	DDT, 4,4'-	9.0E-02	4.5E-06	1	4.1E-07	5.0E-04	8E-04	9.0E-02	3.0E-06	1	2.7E-07	5.0E-04	5E-04	9.0E-02	4.2E-07	1	3.8E-08	3.4E-01	1E-08
24	Dibenz(a,h)ant	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	2.7E-02	4.5E-06	1	1.2E-07	5.0E-05	2E-03	2.7E-02	3.0E-06	1	8.0E-08	5.0E-05	2E-03	2.7E-02	4.2E-07	1	1.1E-08	1.6E+01	2E-07
26	Dimethylbenzen	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
27	Endrin	4.6E-02	4.5E-06	1	2.1E-07	3.0E-04	7E-04	4.6E-02	3.0E-06	1	1.4E-07	3.0E-04	5E-04	4.6E-02	4.2E-07	1	1.9E-08	NA	NA
28	Fluoranthene	7.8E-01	4.5E-06	1	3.5E-06	4.0E-01	9E-06	7.8E-01	3.0E-06	1	2.3E-06	4.0E-02	6E-05	7.8E-01	4.2E-07	1	3.3E-07	NA	NA
29	Fluorene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	4.5E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	3.0E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	4.5E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-04	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	3.1E-03	4.5E-06	1	1.4E-08	5.0E-04	3E-05	3.1E-03	3.0E-06	1	9.3E-09	5.0E-04	2E-05	3.1E-03	4.2E-07	1	1.3E-09	4.5E+00	6E-09
33	Heptachlor epo	1.7E-02	4.5E-06	1	7.7E-08	1.3E-05	6E-03	1.7E-02	3.0E-06	1	5.1E-08	1.3E-05	4E-03	1.7E-02	4.2E-07	1	7.2E-09	9.1E+00	7E-08
34	Indeno(1,2,3-c	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
35	Lead	6.8E+01	4.5E-06	1	3.1E-04	NA	NA	6.8E+01	3.0E-06	1	2.0E-04	NA	NA	6.8E+01	4.2E-07	1	2.9E-05	NA	NA
36	Mercury, inorg	1.1E-01	4.5E-06	1	4.7E-07	3.0E-04	2E-03	1.1E-01	3.0E-06	1	3.2E-07	3.0E-04	1E-03	1.1E-01	4.2E-07	1	4.4E-08	NA	NA
37	Naphthalene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
38	Nickel	2.8E+01	4.5E-06	1	1.3E-04	2.0E-02	6E-03	2.8E+01	3.0E-06	1	8.5E-05	2.0E-02	4E-03	2.8E+01	4.2E-07	1	1.2E-05	NA	NA
39	Nitrate	--	4.5E-06	1	0.0E+00	1.6E+00	0E+00	--	3.0E-06	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
40	Nitrite	--	4.5E-06	1	0.0E+00	1.0E-01	0E+00	--	3.0E-06	1	0.0E+00	1.0E-01	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
41	PCB 1260	1.5E-01	4.5E-06	1	7.0E-07	7.0E-05	1E-02	1.5E-01	3.0E-06	1	4.6E-07	7.0E-05	7E-03	1.5E-01	4.2E-07	1	6.5E-08	7.7E+00	5E-07
42	Phenanthrene	5.3E-01	4.5E-06	1	2.4E-06	4.0E-02	6E-05	5.3E-01	3.0E-06	1	1.6E-06	4.0E-02	4E-05	5.3E-01	4.2E-07	1	2.2E-07	NA	NA
43	Pyrene	9.2E-01	4.5E-06	1	4.1E-06	3.0E-01	1E-05	9.2E-01	3.0E-06	1	2.8E-06	3.0E-02	9E-05	9.2E-01	4.2E-07	1	3.9E-07	NA	NA
44	Silver	4.5E-02	4.5E-06	1	2.0E-07	5.0E-03	4E-05	4.5E-02	3.0E-06	1	1.4E-07	5.0E-03	3E-05	4.5E-02	4.2E-07	1	1.9E-08	NA	NA

45 Sulfide	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	4.5E-06	1	0.0E+00	1.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	1.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	4.5E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: RESIDENT 1

EXPOSURE POINT: ZONE 1-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: DERMAL

HIFs = 3.6E-05
HIFc = 3.4E-05
HIFl = 8.8E-06

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1 Acenaphthene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
2 Acenaphthylene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
3 Aldrin	0.0E+00	3.6E-05	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.7E+01	0E+00
4 Alpha-chlordan	1.3E-01	3.6E-05	1.0E-02	4.8E-08	4.8E-05	1E-03	1.3E-01	3.4E-05	1.0E-02	4.5E-08	4.8E-05	9E-04	1.3E-01	8.8E-06	1.0E-02	1.2E-08	1.6E+00	2E-08
5 Alpha-endosulf	0.0E+00	3.6E-05	1.0E-02	0.0E+00	2.0E-04	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	5.0E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	NA	NA
6 Anthracene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
7 Benzene	0.0E+00	3.6E-05	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	3.4E-05	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	8.8E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8 Benzo(a)anthra	3.7E-01	3.6E-05	NA	NA	NA	NA	3.7E-01	3.4E-05	NA	NA	NA	NA	3.7E-01	8.8E-06	NA	NA	NA	NA
9 Benzo(a)pyrene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
10 Benzo(b)fluora	5.0E-01	3.6E-05	NA	NA	NA	NA	5.0E-01	3.4E-05	NA	NA	NA	NA	5.0E-01	8.8E-06	NA	NA	NA	NA
11 Benzo(g,h,i)pe	5.0E-01	3.6E-05	NA	NA	NA	NA	5.0E-01	3.4E-05	NA	NA	NA	NA	5.0E-01	8.8E-06	NA	NA	NA	NA
12 Benzo(k)fluora	4.6E-01	3.6E-05	NA	NA	NA	NA	4.6E-01	3.4E-05	NA	NA	NA	NA	4.6E-01	8.8E-06	NA	NA	NA	NA
13 Beta-endosulfa	3.3E-03	3.6E-05	1.0E-02	1.2E-09	2.0E-04	6E-06	3.3E-03	3.4E-05	1.0E-02	1.1E-09	5.0E-05	2E-05	3.3E-03	8.8E-06	1.0E-02	2.9E-10	NA	NA
14 Boron	--	3.6E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	3.4E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
15 Cadmium (food	0.0E+00	3.6E-05	1.0E-02	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-02	0.0E+00	2.5E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	NA	NA
16 Cadmium (wate	--	3.6E-05	NA	NA	NA	NA	--	3.4E-05	NA	NA	2.5E-05	NA	--	8.8E-06	NA	NA	NA	NA
17 Chlordane	1.7E-01	3.6E-05	1.0E-02	6.1E-08	6.0E-05	1E-03	1.7E-01	3.4E-05	1.0E-02	5.8E-08	6.0E-05	1E-03	1.7E-01	8.8E-06	1.0E-02	1.5E-08	1.3E+00	2E-08
18 Chromium (VI)	0.0E+00	3.6E-05	NA	NA	1.0E-03	NA	0.0E+00	3.4E-05	NA	NA	2.5E-04	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
19 Chrysene	2.8E-01	3.6E-05	NA	NA	NA	NA	2.8E-01	3.4E-05	NA	NA	NA	NA	2.8E-01	8.8E-06	NA	NA	NA	NA
20 Cyanide (free)	0.0E+00	3.6E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	8.8E-06	3.0E-02	0.0E+00	NA	NA
21 DDD, 4,4'-	2.6E-02	3.6E-05	1.0E-02	9.4E-09	NA	NA	2.6E-02	3.4E-05	1.0E-02	8.9E-09	NA	NA	2.6E-02	8.8E-06	1.0E-02	2.3E-09	2.4E-01	6E-10
22 DDE, 4,4'-	8.3E-02	3.6E-05	1.0E-02	3.0E-08	NA	NA	8.3E-02	3.4E-05	1.0E-02	2.8E-08	NA	NA	8.3E-02	8.8E-06	1.0E-02	7.3E-09	3.4E-01	2E-09
23 DDT, 4,4'-	9.0E-02	3.6E-05	1.0E-02	3.2E-08	5.0E-04	6E-05	9.0E-02	3.4E-05	1.0E-02	3.1E-08	5.0E-04	6E-05	9.0E-02	8.8E-06	1.0E-02	7.9E-09	3.4E-01	3E-09
24 Dibenz(a,h)ant	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
25 Dieldrin	2.7E-02	3.6E-05	1.0E-02	9.6E-09	5.0E-05	2E-04	2.7E-02	3.4E-05	1.0E-02	9.1E-09	5.0E-05	2E-04	2.7E-02	8.8E-06	1.0E-02	2.3E-09	1.6E+01	4E-08
26 Dimethylbenzen	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
27 Endrin	4.6E-02	3.6E-05	1.0E-02	1.7E-08	3.0E-04	6E-05	4.6E-02	3.4E-05	1.0E-02	1.6E-08	3.0E-04	5E-05	4.6E-02	8.8E-06	1.0E-02	4.0E-09	NA	NA
28 Fluoranthene	7.8E-01	3.6E-05	NA	NA	NA	NA	7.8E-01	3.4E-05	NA	NA	NA	NA	7.8E-01	8.8E-06	NA	NA	NA	NA
29 Fluorene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
30 Gamma-chlordan	0.0E+00	3.6E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.6E+00	0E+00
31 Gamma-hexachlo	0.0E+00	3.6E-05	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.3E+00	0E+00
32 Heptachlor	3.1E-03	3.6E-05	1.0E-02	1.1E-09	5.0E-04	2E-06	3.1E-03	3.4E-05	1.0E-02	1.1E-09	5.0E-04	2E-06	3.1E-03	8.8E-06	1.0E-02	2.7E-10	4.5E+00	1E-09
33 Heptachlor epo	1.7E-02	3.6E-05	1.0E-02	6.2E-09	1.3E-05	5E-04	1.7E-02	3.4E-05	1.0E-02	5.8E-09	1.3E-05	4E-04	1.7E-02	8.8E-06	1.0E-02	1.5E-09	9.1E+00	1E-08
34 Indeno(1,2,3-c	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
35 Lead	6.8E+01	3.6E-05	6.0E-03	1.5E-05	NA	NA	6.8E+01	3.4E-05	6.0E-03	1.4E-05	NA	NA	6.8E+01	8.8E-06	6.0E-03	3.6E-06	NA	NA
36 Mercury, inorg	1.1E-01	3.6E-05	1.0E-03	3.8E-09	6.0E-06	6E-04	1.1E-01	3.4E-05	1.0E-03	3.6E-09	6.0E-06	6E-04	1.1E-01	8.8E-06	1.0E-03	9.3E-10	NA	NA
37 Naphthalene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
38 Nickel	2.8E+01	3.6E-05	NA	NA	1.0E-03	NA	2.8E+01	3.4E-05	NA	NA	1.0E-03	NA	2.8E+01	8.8E-06	NA	NA	NA	NA
39 Nitrate	--	3.6E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
40 Nitrite	--	3.6E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
41 PCB 1260	1.5E-01	3.6E-05	6.0E-02	3.3E-07	6.7E-05	5E-03	1.5E-01	3.4E-05	6.0E-02	3.2E-07	6.7E-05	5E-03	1.5E-01	8.8E-06	6.0E-02	8.2E-08	8.1E+00	7E-07
42 Phenanthrene	5.3E-01	3.6E-05	NA	NA	NA	NA	5.3E-01	3.4E-05	NA	NA	NA	NA	5.3E-01	8.8E-06	NA	NA	NA	NA
43 Pyrene	9.2E-01	3.6E-05	NA	NA	NA	NA	9.2E-01	3.4E-05	NA	NA	NA	NA	9.2E-01	8.8E-06	NA	NA	NA	NA
44 Silver	4.5E-02	3.6E-05	1.0E-02	1.6E-08	2.5E-04	6E-05	4.5E-02	3.4E-05	1.0E-02	1.5E-08	2.5E-04	6E-05	4.5E-02	8.8E-06	1.0E-02	4.0E-09	NA	NA

45 Sulfide	--	3.6E-05	1.0E-03	0.0E+00	NA	NA	--	3.4E-05	1.0E-03	0.0E+00	NA	NA	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	3.6E-05	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	3.6E-05	1.0E-02	0.0E+00	NA	NA	--	3.4E-05	1.0E-02	0.0E+00	NA	NA	--	8.8E-06	1.0E-02	0.0E+00	NA	NA
48 Toluene	0.0E+00	3.6E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	3.6E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	3.6E-05	1.0E-03	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	0.0E+00	8.8E-06	1.0E-03	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: WS3

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/19/93

LAND USE: FUTURE
POPULATION: RESIDENT 1

EXPOSURE POINT: ZONE 1-NON EXC
MEDIUM: VEG (0-2')
ROUTE: ORAL

HIFs = 7.8E-04
HIFc = 6.6E-04
HIFl = 1.7E-04

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	7.8E-04	1	0.0E+00	6.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	6.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	7.8E-04	1	0.0E+00	3.0E-05	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.1E-02	7.8E-04	1	8.7E-06	6.0E-05	1E-01	1.1E-02	6.6E-04	1	7.4E-06	6.0E-05	1E-01	1.1E-02	1.7E-04	1	1.9E-06	1.3E+00	2E-06
5	Alpha-endosulf	0.0E+00	7.8E-04	1	0.0E+00	2.0E-04	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	7.8E-04	1	0.0E+00	3.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	7.8E-04	1	0.0E+00	5.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.3E-02	7.8E-04	1	2.6E-05	4.0E-02	7E-04	3.3E-02	6.6E-04	1	2.2E-05	4.0E-02	6E-04	3.3E-02	1.7E-04	1	5.7E-06	7.3E+00	4E-05
9	Benzo(a)pyrene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	5.7E-02	7.8E-04	1	4.5E-05	4.0E-02	1E-03	5.7E-02	6.6E-04	1	3.8E-05	4.0E-02	9E-04	5.7E-02	1.7E-04	1	9.7E-06	7.3E+00	7E-05
11	Benzo(g,h,i)pe	9.4E-02	7.8E-04	1	7.3E-05	4.0E-02	2E-03	9.4E-02	6.6E-04	1	6.2E-05	4.0E-02	2E-03	9.4E-02	1.7E-04	1	1.6E-05	NA	NA
12	Benzo(k)fluora	7.7E-02	7.8E-04	1	6.0E-05	4.0E-02	2E-03	7.7E-02	6.6E-04	1	5.1E-05	4.0E-02	1E-03	7.7E-02	1.7E-04	1	1.3E-05	7.3E+00	1E-04
13	Beta-endosulfa	1.1E-04	7.8E-04	1	8.8E-08	2.0E-04	4E-04	1.1E-04	6.6E-04	1	7.5E-08	5.0E-05	1E-03	1.1E-04	1.7E-04	1	1.9E-08	NA	NA
14	Boron	0.0E+00	7.8E-04	1	0.0E+00	9.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	9.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	1.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
16	Cadmium (wate	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	5.0E-04	NA	NA	1.7E-04	1	NA	NA	NA
17	Chlordane	1.4E-02	7.8E-04	1	1.1E-05	6.0E-05	2E-01	1.4E-02	6.6E-04	1	9.5E-06	6.0E-05	2E-01	1.4E-02	1.7E-04	1	2.5E-06	1.3E+00	3E-06
18	Chromium (VI)	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
19	Chrysene	2.5E-02	7.8E-04	1	1.9E-05	4.0E-02	5E-04	2.5E-02	6.6E-04	1	1.6E-05	4.0E-02	4E-04	2.5E-02	1.7E-04	1	4.2E-06	7.3E+00	3E-05
20	Cyanide (free)	NA	7.8E-04	1	NA	2.0E-02	NA	NA	6.6E-04	1	NA	2.0E-02	NA	NA	1.7E-04	1	NA	NA	NA
21	DDD, 4,4'-	2.5E-03	7.8E-04	1	2.0E-06	NA	NA	2.5E-03	6.6E-04	1	1.7E-06	NA	NA	2.5E-03	1.7E-04	1	4.3E-07	2.4E-01	1E-07
22	DDE, 4,4'-	7.6E-03	7.8E-04	1	5.9E-06	NA	NA	7.6E-03	6.6E-04	1	5.0E-06	NA	NA	7.6E-03	1.7E-04	1	1.3E-06	3.4E-01	4E-07
23	DDT, 4,4'-	1.2E-02	7.8E-04	1	9.1E-06	5.0E-04	2E-02	1.2E-02	6.6E-04	1	7.7E-06	5.0E-04	2E-02	1.2E-02	1.7E-04	1	2.0E-06	3.4E-01	7E-07
24	Dibenz(a,h)ant	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	1.4E-03	7.8E-04	1	1.1E-06	5.0E-05	2E-02	1.4E-03	6.6E-04	1	9.1E-07	5.0E-05	2E-02	1.4E-03	1.7E-04	1	2.3E-07	1.6E+01	4E-06
26	Dimethylbenzen	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
27	Endrin	2.4E-03	7.8E-04	1	1.8E-06	3.0E-04	6E-03	2.4E-03	6.6E-04	1	1.6E-06	3.0E-04	5E-03	2.4E-03	1.7E-04	1	4.0E-07	NA	NA
28	Fluoranthene	4.9E-02	7.8E-04	1	3.8E-05	4.0E-01	1E-04	4.9E-02	6.6E-04	1	3.2E-05	4.0E-02	8E-04	4.9E-02	1.7E-04	1	8.3E-06	NA	NA
29	Fluorene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	7.8E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	6.6E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	7.8E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	1.4E-04	7.8E-04	1	1.1E-07	5.0E-04	2E-04	1.4E-04	6.6E-04	1	9.2E-08	5.0E-04	2E-04	1.4E-04	1.7E-04	1	2.4E-08	4.5E+00	1E-07
33	Heptachlor epo	1.3E-03	7.8E-04	1	1.0E-06	1.3E-05	8E-02	1.3E-03	6.6E-04	1	8.9E-07	1.3E-05	7E-02	1.3E-03	1.7E-04	1	2.3E-07	9.1E+00	2E-06
34	Indeno(1,2,3-c	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
35	Lead	6.8E-02	7.8E-04	1	5.3E-05	NA	NA	6.8E-02	6.6E-04	1	4.5E-05	NA	NA	6.8E-02	1.7E-04	1	1.2E-05	NA	NA
36	Mercury, inorg	2.3E-03	7.8E-04	1	1.8E-06	3.0E-04	6E-03	2.3E-03	6.6E-04	1	1.5E-06	3.0E-04	5E-03	2.3E-03	1.7E-04	1	3.9E-07	NA	NA
37	Naphthalene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
38	Nickel	1.4E-01	7.8E-04	1	1.1E-04	2.0E-02	5E-03	1.4E-01	6.6E-04	1	9.2E-05	2.0E-02	5E-03	1.4E-01	1.7E-04	1	2.4E-05	NA	NA
39	Nitrate	0.0E+00	7.8E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
40	Nitrite	0.0E+00	7.8E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
41	PCB 1260	2.7E-02	7.8E-04	1	2.1E-05	7.0E-05	3E-01	2.7E-02	6.6E-04	1	1.8E-05	7.0E-05	3E-01	2.7E-02	1.7E-04	1	4.5E-06	7.7E+00	3E-05
42	Phenanthrene	2.7E-02	7.8E-04	1	2.1E-05	4.0E-02	5E-04	2.7E-02	6.6E-04	1	1.8E-05	4.0E-02	5E-04	2.7E-02	1.7E-04	1	4.7E-06	NA	NA
43	Pyrene	5.6E-02	7.8E-04	1	4.3E-05	3.0E-01	1E-04	5.6E-02	6.6E-04	1	3.7E-05	3.0E-02	1E-03	5.6E-02	1.7E-04	1	9.4E-06	NA	NA
44	Silver	4.7E-04	7.8E-04	1	3.7E-07	5.0E-03	7E-05	4.7E-04	6.6E-04	1	3.1E-07	5.0E-03	6E-05	4.7E-04	1.7E-04	1	8.0E-08	NA	NA

45 Sulfide	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	NA	NA	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	7.8E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	NA	NA	NA	1.7E-04	1	NA	NA	NA
48 Toluene	0.0E+00	7.8E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/19/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 1

SUBCHRONIC RISK SUMMARY

FUTURE
RESIDENT 1

		SUBCHRONIC DAILY INTAKE (mg/kg/day)						SUBCHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 1-NON	ZONE 1-NON	ZONE 1-NON	0	0	0	ZONE 1-NON	ZONE 1-NON	ZONE 1-NON	0	0	0
		SOIL (0-2')	SOIL (0-2')	VEG (0-2')	0	0	0	SOIL (0-2')	SOIL (0-2')	VEG (0-2')	0	0	0
		ORAL	DERMAL	ORAL	0	0	0	ORAL	DERMAL	ORAL	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0E+00	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
4	Alpha-chlordan	5.9E-07	4.8E-08	8.7E-06				1E-02	1E-03	1E-01			
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
6	Anthracene	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
8	Benzo(a)anthra	1.7E-06	NA	2.6E-05				4E-05	NA	7E-04			
9	Benzo(a)pyrene	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
10	Benzo(b)fluora	2.3E-06	NA	4.5E-05				6E-05	NA	1E-03			
11	Benzo(g,h,i)pe	2.2E-06	NA	7.3E-05				6E-05	NA	2E-03			
12	Benzo(k)fluora	2.1E-06	NA	6.0E-05				5E-05	NA	2E-03			
13	Beta-endosulfa	1.5E-08	1.2E-09	8.8E-08				7E-05	6E-06	4E-04			
14	Boron	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00				NA	NA	NA			
16	Cadmium (wate	0.0E+00	NA	NA				NA	NA	NA			
17	Chlordane	7.7E-07	6.1E-08	1.1E-05				1E-02	1E-03	2E-01			
18	Chromium (VI)	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
19	Chrysene	1.2E-06	NA	1.9E-05				3E-05	NA	5E-04			
20	Cyanide (free)	0.0E+00	0.0E+00	NA				0E+00	0E+00	NA			
21	DDD, 4,4'-	1.2E-07	9.4E-09	2.0E-06				NA	NA	NA			
22	DDE, 4,4'-	3.7E-07	3.0E-08	5.9E-06				NA	NA	NA			
23	DDT, 4,4'-	4.1E-07	3.2E-08	9.1E-06				8E-04	6E-05	2E-02			
24	Dibenz(a,h)ant	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
25	Dieldrin	1.2E-07	9.6E-09	1.1E-06				2E-03	2E-04	2E-02			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
27	Endrin	2.1E-07	1.7E-08	1.8E-06				7E-04	6E-05	6E-03			
28	Fluoranthene	3.5E-06	NA	3.8E-05				9E-06	NA	1E-04			
29	Fluorene	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
32	Heptachlor	1.4E-08	1.1E-09	1.1E-07				3E-05	2E-06	2E-04			
33	Heptachlor epo	7.7E-08	6.2E-09	1.0E-06				6E-03	5E-04	8E-02			
34	Indeno(1,2,3-c	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
35	Lead	3.1E-04	1.5E-05	5.3E-05				NA	NA	NA			
36	Mercury, inorg	4.7E-07	3.8E-09	1.8E-06				2E-03	6E-04	6E-03			
37	Naphthalene	0.0E+00	NA	0.0E+00				0E+00	NA	0E+00			
38	Nickel	1.3E-04	NA	1.1E-04				6E-03	NA	5E-03			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
40	Nitrite	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
41	PCB 1260	7.0E-07	3.3E-07	2.1E-05				1E-02	5E-03	3E-01			
42	Phenanthrene	2.4E-06	NA	2.1E-05				6E-05	NA	5E-04			
43	Pyrene	4.1E-06	NA	4.3E-05				1E-05	NA	1E-04			
44	Silver	2.0E-07	1.6E-08	3.7E-07				4E-05	6E-05	7E-05			
45	Sulfide	0.0E+00	0.0E+00	0.0E+00				NA	NA	NA			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00				0E+00	0E+00	0E+00			
47	Tetrazene	0.0E+00	0.0E+00	NA				NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA		
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
				PATHWAY SUM (HI)	5E-02	8E-03	7E-01	0E+00	0E+00	0E+00
				POPULATION TOTAL	8E-01					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/19/93

CHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 1

CHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 1-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 1-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-NON VEG (0-2') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00			
4	Alpha-chlordan	4.0E-07	4.5E-08	7.4E-06			
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00			
6	Anthracene	0.0E+00	NA	0.0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	1.1E-06	NA	2.2E-05			
9	Benzo(a)pyrene	0.0E+00	NA	0.0E+00			
10	Benzo(b)fluora	1.5E-06	NA	3.8E-05			
11	Benzo(g,h,i)pe	1.5E-06	NA	6.2E-05			
12	Benzo(k)fluora	1.4E-06	NA	5.1E-05			
13	Beta-endosulfa	1.0E-08	1.1E-09	7.5E-08			
14	Boron	0.0E+00	0.0E+00	0.0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	5.1E-07	5.8E-08	9.5E-06			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	8.3E-07	NA	1.6E-05			
20	Cyanide (free)	0.0E+00	0.0E+00	NA			
21	DDD, 4,4'-	7.9E-08	8.9E-09	1.7E-06			
22	DDE, 4,4'-	2.5E-07	2.8E-08	5.0E-06			
23	DDT, 4,4'-	2.7E-07	3.1E-08	7.7E-06			
24	Dibenz(a,h)ant	0.0E+00	NA	0.0E+00			
25	Dieldrin	8.0E-08	9.1E-09	9.1E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.4E-07	1.6E-08	1.6E-06			
28	Fluoranthene	2.3E-06	NA	3.2E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	9.3E-09	1.1E-09	9.2E-08			
33	Heptachlor epo	5.1E-08	5.8E-09	8.9E-07			
34	Indeno(1,2,3-c	0.0E+00	NA	0.0E+00			
35	Lead	2.0E-04	1.4E-05	4.5E-05			
36	Mercury, inorg	3.2E-07	3.6E-09	1.5E-06			
37	Naphthalene	0.0E+00	NA	0.0E+00			
38	Nickel	8.5E-05	NA	9.2E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	0.0E+00	0.0E+00	0.0E+00			
41	PCB 1260	4.6E-07	3.2E-07	1.8E-05			
42	Phenanthrene	1.6E-06	NA	1.8E-05			
43	Pyrene	2.8E-06	NA	3.7E-05			
44	Silver	1.4E-07	1.5E-08	3.1E-07			
45	Sulfide	0.0E+00	0.0E+00	0.0E+00			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	0.0E+00	0.0E+00	NA			

CHRONIC RISK SUMMARY

FUTURE
RESIDENT 1

CHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 ZONE 1-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 1-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-NON VEG (0-2') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0E+00	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	0E+00			
3	Aldrin	0E+00	0E+00	0E+00			
4	Alpha-chlordan	7E-03	9E-04	1E-01			
5	Alpha-endosulf	0E+00	0E+00	0E+00			
6	Anthracene	0E+00	NA	0E+00			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	3E-05	NA	6E-04			
9	Benzo(a)pyrene	0E+00	NA	0E+00			
10	Benzo(b)fluora	4E-05	NA	9E-04			
11	Benzo(g,h,i)pe	4E-05	NA	2E-03			
12	Benzo(k)fluora	3E-05	NA	1E-03			
13	Beta-endosulfa	2E-04	2E-05	1E-03			
14	Boron	0E+00	0E+00	0E+00			
15	Cadmium (food	0E+00	0E+00	0E+00			
16	Cadmium (wate	0E+00	NA	NA			
17	Chlordane	9E-03	1E-03	2E-01			
18	Chromium (VI)	0E+00	NA	0E+00			
19	Chrysene	2E-05	NA	4E-04			
20	Cyanide (free)	0E+00	0E+00	NA			
21	DDD, 4,4'-	NA	NA	NA			
22	DDE, 4,4'-	NA	NA	NA			
23	DDT, 4,4'-	5E-04	6E-05	2E-02			
24	Dibenz(a,h)ant	0E+00	NA	0E+00			
25	Dieldrin	2E-03	2E-04	2E-02			
26	Dimethylbenzen	0E+00	0E+00	0E+00			
27	Endrin	5E-04	5E-05	5E-03			
28	Fluoranthene	6E-05	NA	8E-04			
29	Fluorene	0E+00	NA	0E+00			
30	Gamma-chlordan	0E+00	0E+00	0E+00			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	2E-05	2E-06	2E-04			
33	Heptachlor epo	4E-03	4E-04	7E-02			
34	Indeno(1,2,3-c	0E+00	NA	0E+00			
35	Lead	NA	NA	NA			
36	Mercury, inorg	1E-03	6E-04	5E-03			
37	Naphthalene	0E+00	NA	0E+00			
38	Nickel	4E-03	NA	5E-03			
39	Nitrate	0E+00	0E+00	0E+00			
40	Nitrite	0E+00	0E+00	0E+00			
41	PCB 1260	7E-03	5E-03	3E-01			
42	Phenanthrene	4E-05	NA	5E-04			
43	Pyrene	9E-05	NA	1E-03			
44	Silver	3E-05	6E-05	6E-05			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
				PATHWAY SUM (HI)	4E-02	8E-03	7E-01	0E+00	0E+00	0E+00
				POPULATION TOTAL	7E-01					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP1
LAST UPDATED: 08/19/93

LIFETIME EXPOSURE SUMMARY

FUTURE
RESIDENT 1

	CHEMICAL NAME	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day) SCENARIO 1 ZONE 1-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 1-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-NON VEG (0-2') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00			
4	Alpha-chlordan	5.5E-08	1.2E-08	1.9E-06			
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00			
6	Anthracene	0.0E+00	NA	0.0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	1.6E-07	NA	5.7E-06			
9	Benzo(a)pyrene	0.0E+00	NA	0.0E+00			
10	Benzo(b)fluora	2.1E-07	NA	9.7E-06			
11	Benzo(g,h,i)pe	2.1E-07	NA	1.6E-05			
12	Benzo(k)fluora	1.9E-07	NA	1.3E-05			
13	Beta-endosulfa	1.4E-09	2.9E-10	1.9E-08			
14	Boron	0.0E+00	0.0E+00	0.0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	7.2E-08	1.5E-08	2.5E-06			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	1.2E-07	NA	4.2E-06			
20	Cyanide (free)	0.0E+00	0.0E+00	NA			
21	DDD, 4,4'-	1.1E-08	2.3E-09	4.3E-07			
22	DDE, 4,4'-	3.5E-08	7.3E-09	1.3E-06			
23	DDT, 4,4'-	3.8E-08	7.9E-09	2.0E-06			
24	Dibenz(a,h)ant	0.0E+00	NA	0.0E+00			
25	Dieldrin	1.1E-08	2.3E-09	2.3E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.9E-08	4.0E-09	4.0E-07			
28	Fluoranthene	3.3E-07	NA	8.3E-06			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	1.3E-09	2.7E-10	2.4E-08			
33	Heptachlor epo	7.2E-09	1.5E-09	2.3E-07			
34	Indeno(1,2,3-c	0.0E+00	NA	0.0E+00			
35	Lead	2.9E-05	3.6E-06	1.2E-05			
36	Mercury, inorg	4.4E-08	9.3E-10	3.9E-07			
37	Naphthalene	0.0E+00	NA	0.0E+00			
38	Nickel	1.2E-05	NA	2.4E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	0.0E+00	0.0E+00	0.0E+00			
41	PCB 1260	6.5E-08	8.2E-08	4.5E-06			
42	Phenanthrene	2.2E-07	NA	4.7E-06			
43	Pyrene	3.9E-07	NA	9.4E-06			
44	Silver	1.9E-08	4.0E-09	8.0E-08			
45	Sulfide	0.0E+00	0.0E+00	0.0E+00			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	0.0E+00	0.0E+00	NA			

LIFETIME RISK SUMMARY

FUTURE
RESIDENT 1

	CHEMICAL NAME	LIFETIME EXCESS CANCER RISK SCENARIO 1 ZONE 1-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 1-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-NON VEG (0-2') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	NA	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA	NA			
3	Aldrin	0E+00	0E+00	0E+00			
4	Alpha-chlordan	7E-08	2E-08	2E-06			
5	Alpha-endosulf	NA	NA	NA			
6	Anthracene	NA	NA	NA			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	1E-06	NA	4E-05			
9	Benzo(a)pyrene	0E+00	NA	0E+00			
10	Benzo(b)fluora	2E-06	NA	7E-05			
11	Benzo(g,h,i)pe	NA	NA	NA			
12	Benzo(k)fluora	1E-06	NA	1E-04			
13	Beta-endosulfa	NA	NA	NA			
14	Boron	NA	NA	NA			
15	Cadmium (food	NA	NA	NA			
16	Cadmium (wate	NA	NA	NA			
17	Chlordane	9E-08	2E-08	3E-06			
18	Chromium (VI)	NA	NA	NA			
19	Chrysene	9E-07	NA	3E-05			
20	Cyanide (free)	NA	NA	NA			
21	DDD, 4,4'-	3E-09	6E-10	1E-07			
22	DDE, 4,4'-	1E-08	2E-09	4E-07			
23	DDT, 4,4'-	1E-08	3E-09	7E-07			
24	Dibenz(a,h)ant	0E+00	NA	0E+00			
25	Dieldrin	2E-07	4E-08	4E-06			
26	Dimethylbenzen	NA	NA	NA			
27	Endrin	NA	NA	NA			
28	Fluoranthene	NA	NA	NA			
29	Fluorene	NA	NA	NA			
30	Gamma-chlordan	0E+00	0E+00	0E+00			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	6E-09	1E-09	1E-07			
33	Heptachlor epo	7E-08	1E-08	2E-06			
34	Indeno(1,2,3-c	0E+00	NA	0E+00			
35	Lead	NA	NA	NA			
36	Mercury, inorg	NA	NA	NA			
37	Naphthalene	NA	NA	NA			
38	Nickel	NA	NA	NA			
39	Nitrate	NA	NA	NA			
40	Nitrite	NA	NA	NA			
41	PCB 1260	5E-07	7E-07	3E-05			
42	Phenanthrene	NA	NA	NA			
43	Pyrene	NA	NA	NA			
44	Silver	NA	NA	NA			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA			
				TOTAL PATHWAY CANCER RISK	6E-06	8E-07	3E-04	0E+00	0E+00	0E+00
				POPULATION TOTAL EXCESS RISK	3E-04					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP2
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 2

EXPOSURE POINT: ZONE 2-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 4.5E-06
HIFc = 3.0E-06
HIFl = 4.2E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	3.2E-01	4.5E-06	1	1.4E-06	6.0E-01	2E-06	3.2E-01	3.0E-06	1	9.6E-07	6.0E-02	2E-05	3.2E-01	4.2E-07	1	1.3E-07	NA	NA
2	Acenaphthylene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
3	Aldrin	5.1E-02	4.5E-06	1	2.3E-07	3.0E-05	8E-03	5.1E-02	3.0E-06	1	1.5E-07	3.0E-05	5E-03	5.1E-02	4.2E-07	1	2.1E-08	1.7E+01	4E-07
4	Alpha-chlordan	3.8E-01	4.5E-06	1	1.7E-06	6.0E-05	3E-02	3.8E-01	3.0E-06	1	1.1E-06	6.0E-05	2E-02	3.8E-01	4.2E-07	1	1.6E-07	1.3E+00	2E-07
5	Alpha-endosulf	6.0E-03	4.5E-06	1	2.7E-08	2.0E-04	1E-04	6.0E-03	3.0E-06	1	1.8E-08	5.0E-05	4E-04	6.0E-03	4.2E-07	1	2.5E-09	NA	NA
6	Anthracene	8.6E-01	4.5E-06	1	3.9E-06	3.0E+00	1E-06	8.6E-01	3.0E-06	1	2.6E-06	3.0E-01	9E-06	8.6E-01	4.2E-07	1	3.6E-07	NA	NA
7	Benzene	4.7E-02	4.5E-06	1	2.1E-07	5.0E-02	4E-06	4.7E-02	3.0E-06	1	1.4E-07	5.0E-03	3E-05	4.7E-02	4.2E-07	1	2.0E-08	2.9E-02	6E-10
8	Benzo(a)anthra	1.7E+00	4.5E-06	1	7.8E-06	4.0E-02	2E-04	1.7E+00	3.0E-06	1	5.2E-06	4.0E-02	1E-04	1.7E+00	4.2E-07	1	7.2E-07	7.3E+00	5E-06
9	Benzo(a)pyrene	1.8E+00	4.5E-06	1	8.2E-06	4.0E-02	2E-04	1.8E+00	3.0E-06	1	5.5E-06	4.0E-02	1E-04	1.8E+00	4.2E-07	1	7.7E-07	7.3E+00	6E-06
10	Benzo(b)fluora	1.9E+00	4.5E-06	1	8.4E-06	4.0E-02	2E-04	1.9E+00	3.0E-06	1	5.6E-06	4.0E-02	1E-04	1.9E+00	4.2E-07	1	7.8E-07	7.3E+00	6E-06
11	Benzo(g,h,i)pe	1.7E+00	4.5E-06	1	7.5E-06	4.0E-02	2E-04	1.7E+00	3.0E-06	1	5.0E-06	4.0E-02	1E-04	1.7E+00	4.2E-07	1	7.0E-07	NA	NA
12	Benzo(k)fluora	1.7E+00	4.5E-06	1	7.7E-06	4.0E-02	2E-04	1.7E+00	3.0E-06	1	5.2E-06	4.0E-02	1E-04	1.7E+00	4.2E-07	1	7.2E-07	7.3E+00	5E-06
13	Beta-endosulfa	4.7E-02	4.5E-06	1	2.1E-07	2.0E-04	1E-03	4.7E-02	3.0E-06	1	1.4E-07	5.0E-05	3E-03	4.7E-02	4.2E-07	1	2.0E-08	NA	NA
14	Boron	0.0E+00	4.5E-06	1	0.0E+00	9.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	9.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
15	Cadmium (food	9.7E-01	4.5E-06	1	4.4E-06	NA	NA	9.7E-01	3.0E-06	1	2.9E-06	1.0E-03	3E-03	9.7E-01	4.2E-07	1	4.1E-07	NA	NA
16	Cadmium (wate	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	5.0E-04	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
17	Chlordane	8.3E-01	4.5E-06	1	3.7E-06	6.0E-05	6E-02	8.3E-01	3.0E-06	1	2.5E-06	6.0E-05	4E-02	8.3E-01	4.2E-07	1	3.5E-07	1.3E+00	5E-07
18	Chromium (VI)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
19	Chrysene	1.2E+00	4.5E-06	1	5.4E-06	4.0E-02	1E-04	1.2E+00	3.0E-06	1	3.6E-06	4.0E-02	9E-05	1.2E+00	4.2E-07	1	5.1E-07	7.3E+00	4E-06
20	Cyanide (free)	6.7E-01	4.5E-06	1	3.0E-06	2.0E-02	1E-04	6.7E-01	3.0E-06	1	2.0E-06	2.0E-02	1E-04	6.7E-01	4.2E-07	1	2.8E-07	NA	NA
21	DDD, 4,4'-	1.2E-01	4.5E-06	1	5.5E-07	NA	NA	1.2E-01	3.0E-06	1	3.7E-07	NA	NA	1.2E-01	4.2E-07	1	5.2E-08	2.4E-01	1E-08
22	DDE, 4,4'-	2.2E-01	4.5E-06	1	9.8E-07	NA	NA	2.2E-01	3.0E-06	1	6.5E-07	NA	NA	2.2E-01	4.2E-07	1	9.1E-08	3.4E-01	3E-08
23	DDT, 4,4'-	2.7E-01	4.5E-06	1	1.2E-06	5.0E-04	2E-03	2.7E-01	3.0E-06	1	8.0E-07	5.0E-04	2E-03	2.7E-01	4.2E-07	1	1.1E-07	3.4E-01	4E-08
24	Dibenz(a,h)ant	3.8E-01	4.5E-06	1	1.7E-06	4.0E-02	4E-05	3.8E-01	3.0E-06	1	1.1E-06	4.0E-02	3E-05	3.8E-01	4.2E-07	1	1.6E-07	7.3E+00	1E-06
25	Dieldrin	1.8E-01	4.5E-06	1	7.9E-07	5.0E-05	2E-02	1.8E-01	3.0E-06	1	5.3E-07	5.0E-05	1E-02	1.8E-01	4.2E-07	1	7.4E-08	1.6E+01	1E-06
26	Dimethylbenzen	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
27	Endrin	1.6E-01	4.5E-06	1	7.0E-07	3.0E-04	2E-03	1.6E-01	3.0E-06	1	4.7E-07	3.0E-04	2E-03	1.6E-01	4.2E-07	1	6.5E-08	NA	NA
28	Fluoranthene	2.1E+00	4.5E-06	1	9.4E-06	4.0E-01	2E-05	2.1E+00	3.0E-06	1	6.3E-06	4.0E-02	2E-04	2.1E+00	4.2E-07	1	8.8E-07	NA	NA
29	Fluorene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	4.0E-01	4.5E-06	1	1.8E-06	6.0E-05	3E-02	4.0E-01	3.0E-06	1	1.2E-06	6.0E-05	2E-02	4.0E-01	4.2E-07	1	1.7E-07	1.3E+00	2E-07
31	Gamma-hexachlo	1.3E-02	4.5E-06	1	5.9E-08	3.0E-03	2E-05	1.3E-02	3.0E-06	1	3.9E-08	3.0E-04	1E-04	1.3E-02	4.2E-07	1	5.5E-09	1.3E+00	7E-09
32	Heptachlor	2.9E-02	4.5E-06	1	1.3E-07	5.0E-04	3E-04	2.9E-02	3.0E-06	1	8.6E-08	5.0E-04	2E-04	2.9E-02	4.2E-07	1	1.2E-08	4.5E+00	5E-08
33	Heptachlor epo	9.2E-02	4.5E-06	1	4.1E-07	1.3E-05	3E-02	9.2E-02	3.0E-06	1	2.7E-07	1.3E-05	2E-02	9.2E-02	4.2E-07	1	3.8E-08	9.1E+00	3E-07
34	Indeno(1,2,3-c	2.3E+00	4.5E-06	1	1.1E-05	4.0E-02	3E-04	2.3E+00	3.0E-06	1	7.0E-06	4.0E-02	2E-04	2.3E+00	4.2E-07	1	9.9E-07	7.3E+00	7E-06
35	Lead	3.9E+02	4.5E-06	1	1.7E-03	NA	NA	3.9E+02	3.0E-06	1	1.2E-03	NA	NA	3.9E+02	4.2E-07	1	1.6E-04	NA	NA
36	Mercury, inorg	2.8E-01	4.5E-06	1	1.3E-06	3.0E-04	4E-03	2.8E-01	3.0E-06	1	8.4E-07	3.0E-04	3E-03	2.8E-01	4.2E-07	1	1.2E-07	NA	NA
37	Naphthalene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
38	Nickel	3.4E+01	4.5E-06	1	1.5E-04	2.0E-02	8E-03	3.4E+01	3.0E-06	1	1.0E-04	2.0E-02	5E-03	3.4E+01	4.2E-07	1	1.4E-05	NA	NA
39	Nitrate	--	4.5E-06	1	0.0E+00	1.6E+00	0E+00	--	3.0E-06	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
40	Nitrite	5.3E+00	4.5E-06	1	2.4E-05	1.0E-01	2E-04	5.3E+00	3.0E-06	1	1.6E-05	1.0E-01	2E-04	5.3E+00	4.2E-07	1	2.2E-06	NA	NA
41	PCB 1260	3.0E-01	4.5E-06	1	1.4E-06	7.0E-05	2E-02	3.0E-01	3.0E-06	1	9.1E-07	7.0E-05	1E-02	3.0E-01	4.2E-07	1	1.3E-07	7.7E+00	1E-06
42	Phenanthrene	2.7E+00	4.5E-06	1	1.2E-05	4.0E-02	3E-04	2.7E+00	3.0E-06	1	8.2E-06	4.0E-02	2E-04	2.7E+00	4.2E-07	1	1.1E-06	NA	NA
43	Pyrene	2.7E+00	4.5E-06	1	1.2E-05	3.0E-01	4E-05	2.7E+00	3.0E-06	1	8.2E-06	3.0E-02	3E-04	2.7E+00	4.2E-07	1	1.1E-06	NA	NA
44	Silver	7.7E-01	4.5E-06	1	3.5E-06	5.0E-03	7E-04	7.7E-01	3.0E-06	1	2.3E-06	5.0E-03	5E-04	7.7E-01	4.2E-07	1	3.2E-07	NA	NA

45	Sulfide	2.8E+02	4.5E-06	1	1.2E-03	NA	NA	2.8E+02	3.0E-06	1	8.3E-04	NA	NA	2.8E+02	4.2E-07	1	1.2E-04	NA	NA
46	Tetrachloroeth	2.0E-03	4.5E-06	1	9.0E-09	1.0E-01	9E-08	2.0E-03	3.0E-06	1	6.0E-09	1.0E-02	6E-07	2.0E-03	4.2E-07	1	8.4E-10	5.2E-02	4E-11
47	Tetrazene	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA
48	Toluene	4.5E-02	4.5E-06	1	2.0E-07	2.0E+00	1E-07	4.5E-02	3.0E-06	1	1.4E-07	2.0E-01	7E-07	4.5E-02	4.2E-07	1	1.9E-08	NA	NA
49	Trichloroethen	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP2
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 2

EXPOSURE POINT: ZONE 2-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: DERMAL

HIFs = 3.6E-05
HIFc = 3.4E-05
HIFl = 8.8E-06

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	3.2E-01	3.6E-05	NA	NA	NA	NA	3.2E-01	3.4E-05	NA	NA	NA	NA	3.2E-01	8.8E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
3	Aldrin	5.1E-02	3.6E-05	1.0E-02	1.8E-08	3.0E-05	6E-04	5.1E-02	3.4E-05	1.0E-02	1.7E-08	3.0E-05	6E-04	5.1E-02	8.8E-06	1.0E-02	4.5E-09	1.7E+01	8E-08
4	Alpha-chlordan	3.8E-01	3.6E-05	1.0E-02	1.4E-07	4.8E-05	3E-03	3.8E-01	3.4E-05	1.0E-02	1.3E-07	4.8E-05	3E-03	3.8E-01	8.8E-06	1.0E-02	3.4E-08	1.6E+00	5E-08
5	Alpha-endosulf	6.0E-03	3.6E-05	1.0E-02	2.2E-09	2.0E-04	1E-05	6.0E-03	3.4E-05	1.0E-02	2.1E-09	5.0E-05	4E-05	6.0E-03	8.8E-06	1.0E-02	5.3E-10	NA	NA
6	Anthracene	8.6E-01	3.6E-05	NA	NA	NA	NA	8.6E-01	3.4E-05	NA	NA	NA	NA	8.6E-01	8.8E-06	NA	NA	NA	NA
7	Benzene	4.7E-02	3.6E-05	8.0E-02	1.3E-07	5.0E-02	3E-06	4.7E-02	3.4E-05	8.0E-02	1.3E-07	5.0E-03	3E-05	4.7E-02	8.8E-06	8.0E-02	3.3E-08	2.9E-02	1E-09
8	Benzo(a)anthra	1.7E+00	3.6E-05	NA	NA	NA	NA	1.7E+00	3.4E-05	NA	NA	NA	NA	1.7E+00	8.8E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	1.8E+00	3.6E-05	NA	NA	NA	NA	1.8E+00	3.4E-05	NA	NA	NA	NA	1.8E+00	8.8E-06	NA	NA	NA	NA
10	Benzo(b)fluora	1.9E+00	3.6E-05	NA	NA	NA	NA	1.9E+00	3.4E-05	NA	NA	NA	NA	1.9E+00	8.8E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	1.7E+00	3.6E-05	NA	NA	NA	NA	1.7E+00	3.4E-05	NA	NA	NA	NA	1.7E+00	8.8E-06	NA	NA	NA	NA
12	Benzo(k)fluora	1.7E+00	3.6E-05	NA	NA	NA	NA	1.7E+00	3.4E-05	NA	NA	NA	NA	1.7E+00	8.8E-06	NA	NA	NA	NA
13	Beta-endosulfa	4.7E-02	3.6E-05	1.0E-02	1.7E-08	2.0E-04	9E-05	4.7E-02	3.4E-05	1.0E-02	1.6E-08	5.0E-05	3E-04	4.7E-02	8.8E-06	1.0E-02	4.2E-09	NA	NA
14	Boron	0.0E+00	3.6E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	0.0E+00	8.8E-06	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	9.7E-01	3.6E-05	1.0E-02	3.5E-07	NA	NA	9.7E-01	3.4E-05	1.0E-02	3.3E-07	2.5E-05	1E-02	9.7E-01	8.8E-06	1.0E-02	8.5E-08	NA	NA
16	Cadmium (wate	--	3.6E-05	NA	NA	NA	NA	--	3.4E-05	NA	NA	2.5E-05	NA	--	8.8E-06	NA	NA	NA	NA
17	Chlordane	8.3E-01	3.6E-05	1.0E-02	3.0E-07	6.0E-05	5E-03	8.3E-01	3.4E-05	1.0E-02	2.8E-07	6.0E-05	5E-03	8.3E-01	8.8E-06	1.0E-02	7.3E-08	1.3E+00	9E-08
18	Chromium (VI)	0.0E+00	3.6E-05	NA	NA	1.0E-03	NA	0.0E+00	3.4E-05	NA	NA	2.5E-04	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
19	Chrysene	1.2E+00	3.6E-05	NA	NA	NA	NA	1.2E+00	3.4E-05	NA	NA	NA	NA	1.2E+00	8.8E-06	NA	NA	NA	NA
20	Cyanide (free)	6.7E-01	3.6E-05	3.0E-02	7.2E-07	2.0E-02	4E-05	6.7E-01	3.4E-05	3.0E-02	6.8E-07	2.0E-02	3E-05	6.7E-01	8.8E-06	3.0E-02	1.8E-07	NA	NA
21	DDD, 4,4'-	1.2E-01	3.6E-05	1.0E-02	4.4E-08	NA	NA	1.2E-01	3.4E-05	1.0E-02	4.2E-08	NA	NA	1.2E-01	8.8E-06	1.0E-02	1.1E-08	2.4E-01	3E-09
22	DDE, 4,4'-	2.2E-01	3.6E-05	1.0E-02	7.8E-08	NA	NA	2.2E-01	3.4E-05	1.0E-02	7.4E-08	NA	NA	2.2E-01	8.8E-06	1.0E-02	1.9E-08	3.4E-01	7E-09
23	DDT, 4,4'-	2.7E-01	3.6E-05	1.0E-02	9.5E-08	5.0E-04	2E-04	2.7E-01	3.4E-05	1.0E-02	9.0E-08	5.0E-04	2E-04	2.7E-01	8.8E-06	1.0E-02	2.3E-08	3.4E-01	8E-09
24	Dibenz(a,h)ant	3.8E-01	3.6E-05	NA	NA	NA	NA	3.8E-01	3.4E-05	NA	NA	NA	NA	3.8E-01	8.8E-06	NA	NA	NA	NA
25	Dieldrin	1.8E-01	3.6E-05	1.0E-02	6.3E-08	5.0E-05	1E-03	1.8E-01	3.4E-05	1.0E-02	6.0E-08	5.0E-05	1E-03	1.8E-01	8.8E-06	1.0E-02	1.5E-08	1.6E+01	2E-07
26	Dimethylbenzen	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	1.6E-01	3.6E-05	1.0E-02	5.6E-08	3.0E-04	2E-04	1.6E-01	3.4E-05	1.0E-02	5.3E-08	3.0E-04	2E-04	1.6E-01	8.8E-06	1.0E-02	1.4E-08	NA	NA
28	Fluoranthene	2.1E+00	3.6E-05	NA	NA	NA	NA	2.1E+00	3.4E-05	NA	NA	NA	NA	2.1E+00	8.8E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
30	Gamma-chlordan	4.0E-01	3.6E-05	1.0E-02	1.4E-07	4.8E-05	3E-03	4.0E-01	3.4E-05	1.0E-02	1.4E-07	4.8E-05	3E-03	4.0E-01	8.8E-06	1.0E-02	3.5E-08	1.6E+00	6E-08
31	Gamma-hexachlo	1.3E-02	3.6E-05	1.0E-02	4.7E-09	3.0E-03	2E-06	1.3E-02	3.4E-05	1.0E-02	4.5E-09	3.0E-04	1E-05	1.3E-02	8.8E-06	1.0E-02	1.2E-09	1.3E+00	1E-09
32	Heptachlor	2.9E-02	3.6E-05	1.0E-02	1.0E-08	5.0E-04	2E-05	2.9E-02	3.4E-05	1.0E-02	9.8E-09	5.0E-04	2E-05	2.9E-02	8.8E-06	1.0E-02	2.5E-09	4.5E+00	1E-08
33	Heptachlor epo	9.2E-02	3.6E-05	1.0E-02	3.3E-08	1.3E-05	3E-03	9.2E-02	3.4E-05	1.0E-02	3.1E-08	1.3E-05	2E-03	9.2E-02	8.8E-06	1.0E-02	8.1E-09	9.1E+00	7E-08
34	Indeno(1,2,3-c	2.3E+00	3.6E-05	NA	NA	NA	NA	2.3E+00	3.4E-05	NA	NA	NA	NA	2.3E+00	8.8E-06	NA	NA	NA	NA
35	Lead	3.9E+02	3.6E-05	6.0E-03	8.4E-05	NA	NA	3.9E+02	3.4E-05	6.0E-03	7.9E-05	NA	NA	3.9E+02	8.8E-06	6.0E-03	2.0E-05	NA	NA
36	Mercury, inorg	2.8E-01	3.6E-05	1.0E-03	1.0E-08	6.0E-06	2E-03	2.8E-01	3.4E-05	1.0E-03	9.5E-09	6.0E-06	2E-03	2.8E-01	8.8E-06	1.0E-03	2.5E-09	NA	NA
37	Naphthalene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
38	Nickel	3.4E+01	3.6E-05	NA	NA	1.0E-03	NA	3.4E+01	3.4E-05	NA	NA	1.0E-03	NA	3.4E+01	8.8E-06	NA	NA	NA	NA
39	Nitrate	--	3.6E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	5.3E+00	3.6E-05	1.0E-03	1.9E-07	1.0E-01	2E-06	5.3E+00	3.4E-05	1.0E-03	1.8E-07	1.0E-01	2E-06	5.3E+00	8.8E-06	1.0E-03	4.7E-08	NA	NA
41	PCB 1260	3.0E-01	3.6E-05	6.0E-02	6.5E-07	6.7E-05	1E-02	3.0E-01	3.4E-05	6.0E-02	6.2E-07	6.7E-05	9E-03	3.0E-01	8.8E-06	6.0E-02	1.6E-07	8.1E+00	1E-06
42	Phenanthrene	2.7E+00	3.6E-05	NA	NA	NA	NA	2.7E+00	3.4E-05	NA	NA	NA	NA	2.7E+00	8.8E-06	NA	NA	NA	NA
43	Pyrene	2.7E+00	3.6E-05	NA	NA	NA	NA	2.7E+00	3.4E-05	NA	NA	NA	NA	2.7E+00	8.8E-06	NA	NA	NA	NA
44	Silver	7.7E-01	3.6E-05	1.0E-02	2.8E-07	2.5E-04	1E-03	7.7E-01	3.4E-05	1.0E-02	2.6E-07	2.5E-04	1E-03	7.7E-01	8.8E-06	1.0E-02	6.8E-08	NA	NA

45 Sulfide	2.8E+02	3.6E-05	1.0E-03	1.0E-05	NA	NA	2.8E+02	3.4E-05	1.0E-03	9.4E-06	NA	NA	2.8E+02	8.8E-06	1.0E-03	2.4E-06	NA	NA
46 Tetrachloroeth	2.0E-03	3.6E-05	1.0E-01	7.2E-09	1.0E-01	7E-08	2.0E-03	3.4E-05	1.0E-01	6.8E-09	1.0E-02	7E-07	2.0E-03	8.8E-06	1.0E-01	1.8E-09	5.2E-02	9E-11
47 Tetrazene	--	3.6E-05	1.0E-02	0.0E+00	NA	NA	--	3.4E-05	1.0E-02	0.0E+00	NA	NA	--	8.8E-06	1.0E-02	0.0E+00	NA	NA
48 Toluene	4.5E-02	3.6E-05	1.2E-01	1.9E-07	2.0E+00	1E-07	4.5E-02	3.4E-05	1.2E-01	1.8E-07	2.0E-01	9E-07	4.5E-02	8.8E-06	1.2E-01	4.8E-08	NA	NA
49 Trichloroethen	0.0E+00	3.6E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	3.6E-05	1.0E-03	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	0.0E+00	8.8E-06	1.0E-03	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP2
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 2

SUBCHRONIC RISK SUMMARY

FUTURE
RESIDENT 2

		SUBCHRONIC DAILY INTAKE (mg/kg/day)						SUBCHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 2-NON	ZONE 2-NON	0	0	0	0	ZONE 2-NON	ZONE 2-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0	SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0	ORAL	DERMAL	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1.4E-06	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2E-06	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00	NA					0E+00	NA				
3	Aldrin	2.3E-07	1.8E-08					8E-03	6E-04				
4	Alpha-chlordan	1.7E-06	1.4E-07					3E-02	3E-03				
5	Alpha-endosulf	2.7E-08	2.2E-09					1E-04	1E-05				
6	Anthracene	3.9E-06	NA					1E-06	NA				
7	Benzene	2.1E-07	1.3E-07					4E-06	3E-06				
8	Benzo(a)anthra	7.8E-06	NA					2E-04	NA				
9	Benzo(a)pyrene	8.2E-06	NA					2E-04	NA				
10	Benzo(b)fluora	8.4E-06	NA					2E-04	NA				
11	Benzo(g,h,i)pe	7.5E-06	NA					2E-04	NA				
12	Benzo(k)fluora	7.7E-06	NA					2E-04	NA				
13	Beta-endosulfa	2.1E-07	1.7E-08					1E-03	9E-05				
14	Boron	0.0E+00	0.0E+00					0E+00	0E+00				
15	Cadmium (food	4.4E-06	3.5E-07					NA	NA				
16	Cadmium (wate	0.0E+00	NA					NA	NA				
17	Chlordane	3.7E-06	3.0E-07					6E-02	5E-03				
18	Chromium (VI)	0.0E+00	NA					0E+00	NA				
19	Chrysene	5.4E-06	NA					1E-04	NA				
20	Cyanide (free)	3.0E-06	7.2E-07					1E-04	4E-05				
21	DDD, 4,4'-	5.5E-07	4.4E-08					NA	NA				
22	DDE, 4,4'-	9.8E-07	7.8E-08					NA	NA				
23	DDT, 4,4'-	1.2E-06	9.5E-08					2E-03	2E-04				
24	Dibenz(a,h)ant	1.7E-06	NA					4E-05	NA				
25	Dieldrin	7.9E-07	6.3E-08					2E-02	1E-03				
26	Dimethylbenzen	0.0E+00	0.0E+00					0E+00	0E+00				
27	Endrin	7.0E-07	5.6E-08					2E-03	2E-04				
28	Fluoranthene	9.4E-06	NA					2E-05	NA				
29	Fluorene	0.0E+00	NA					0E+00	NA				
30	Gamma-chlordan	1.8E-06	1.4E-07					3E-02	3E-03				
31	Gamma-hexachlo	5.9E-08	4.7E-09					2E-05	2E-06				
32	Heptachlor	1.3E-07	1.0E-08					3E-04	2E-05				
33	Heptachlor epo	4.1E-07	3.3E-08					3E-02	3E-03				
34	Indeno(1,2,3-c	1.1E-05	NA					3E-04	NA				
35	Lead	1.7E-03	8.4E-05					NA	NA				
36	Mercury, inorg	1.3E-06	1.0E-08					4E-03	2E-03				
37	Naphthalene	0.0E+00	NA					0E+00	NA				
38	Nickel	1.5E-04	NA					8E-03	NA				
39	Nitrate	0.0E+00	0.0E+00					0E+00	0E+00				
40	Nitrite	2.4E-05	1.9E-07					2E-04	2E-06				
41	PCB 1260	1.4E-06	6.5E-07					2E-02	1E-02				
42	Phenanthrene	1.2E-05	NA					3E-04	NA				
43	Pyrene	1.2E-05	NA					4E-05	NA				
44	Silver	3.5E-06	2.8E-07					7E-04	1E-03				
45	Sulfide	1.2E-03	1.0E-05					NA	NA				
46	Tetrachloroeth	9.0E-09	7.2E-09					9E-08	7E-08				
47	Tetrazene	0.0E+00	0.0E+00					NA	NA				

48 Toluene	2.0E-07	1.9E-07		1E-07	1E-07				
49 Trichloroethen	0.0E+00	0.0E+00		0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00		NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00		0E+00	0E+00				
			PATHWAY SUM (HI)	2E-01	3E-02	0E+00	0E+00	0E+00	0E+00
			POPULATION TOTAL	2E-01					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP2
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 2

CHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 2-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 2-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	9.6E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	1.5E-07	1.7E-08				
4	Alpha-chlordan	1.1E-06	1.3E-07				
5	Alpha-endosulf	1.8E-08	2.1E-09				
6	Anthracene	2.6E-06	NA				
7	Benzene	1.4E-07	1.3E-07				
8	Benzo(a)anthra	5.2E-06	NA				
9	Benzo(a)pyrene	5.5E-06	NA				
10	Benzo(b)fluora	5.6E-06	NA				
11	Benzo(g,h,i)pe	5.0E-06	NA				
12	Benzo(k)fluora	5.2E-06	NA				
13	Beta-endosulfa	1.4E-07	1.6E-08				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	2.9E-06	3.3E-07				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	2.5E-06	2.8E-07				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	3.6E-06	NA				
20	Cyanide (free)	2.0E-06	6.8E-07				
21	DDD, 4,4'-	3.7E-07	4.2E-08				
22	DDE, 4,4'-	6.5E-07	7.4E-08				
23	DDT, 4,4'-	8.0E-07	9.0E-08				
24	Dibenz(a,h)ant	1.1E-06	NA				
25	Dieldrin	5.3E-07	6.0E-08				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	4.7E-07	5.3E-08				
28	Fluoranthene	6.3E-06	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	1.2E-06	1.4E-07				
31	Gamma-hexachlo	3.9E-08	4.5E-09				
32	Heptachlor	8.6E-08	9.8E-09				
33	Heptachlor epo	2.7E-07	3.1E-08				
34	Indeno(1,2,3-c	7.0E-06	NA				
35	Lead	1.2E-03	7.9E-05				
36	Mercury, inorg	8.4E-07	9.5E-09				
37	Naphthalene	0.0E+00	NA				
38	Nickel	1.0E-04	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	1.6E-05	1.8E-07				
41	PCB 1260	9.1E-07	6.2E-07				
42	Phenanthrene	8.2E-06	NA				
43	Pyrene	8.2E-06	NA				
44	Silver	2.3E-06	2.6E-07				
45	Sulfide	8.3E-04	9.4E-06				
46	Tetrachloroeth	6.0E-09	6.8E-09				
47	Tetrazene	0.0E+00	0.0E+00				

CHRONIC RISK SUMMARY

FUTURE
RESIDENT 2

CHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 ZONE 2-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 2-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	2E-05	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	5E-03	6E-04				
4	Alpha-chlordan	2E-02	3E-03				
5	Alpha-endosulf	4E-04	4E-05				
6	Anthracene	9E-06	NA				
7	Benzene	3E-05	3E-05				
8	Benzo(a)anthra	1E-04	NA				
9	Benzo(a)pyrene	1E-04	NA				
10	Benzo(b)fluora	1E-04	NA				
11	Benzo(g,h,i)pe	1E-04	NA				
12	Benzo(k)fluora	1E-04	NA				
13	Beta-endosulfa	3E-03	3E-04				
14	Boron	0E+00	0E+00				
15	Cadmium (food	3E-03	1E-02				
16	Cadmium (wate	0E+00	NA				
17	Chlordane	4E-02	5E-03				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	9E-05	NA				
20	Cyanide (free)	1E-04	3E-05				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	2E-03	2E-04				
24	Dibenz(a,h)ant	3E-05	NA				
25	Dieldrin	1E-02	1E-03				
26	Dimethylbenzen	0E+00	0E+00				
27	Endrin	2E-03	2E-04				
28	Fluoranthene	2E-04	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	2E-02	3E-03				
31	Gamma-hexachlo	1E-04	1E-05				
32	Heptachlor	2E-04	2E-05				
33	Heptachlor epo	2E-02	2E-03				
34	Indeno(1,2,3-c	2E-04	NA				
35	Lead	NA	NA				
36	Mercury, inorg	3E-03	2E-03				
37	Naphthalene	0E+00	NA				
38	Nickel	5E-03	NA				
39	Nitrate	0E+00	0E+00				
40	Nitrite	2E-04	2E-06				
41	PCB 1260	1E-02	9E-03				
42	Phenanthrene	2E-04	NA				
43	Pyrene	3E-04	NA				
44	Silver	5E-04	1E-03				
45	Sulfide	NA	NA				
46	Tetrachloroeth	6E-07	7E-07				
47	Tetrazene	NA	NA				

48 Toluene	1.4E-07	1.8E-07		7E-07	9E-07				
49 Trichloroethen	0.0E+00	0.0E+00		0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00		0E+00	0E+00				
51 Xylenes (total	0.0E+00	0.0E+00		0E+00	0E+00				
			PATHWAY SUM (HI)	1E-01	4E-02	0E+00	0E+00	0E+00	0E+00
			POPULATION TOTAL	1E-01					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP2
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
RESIDENT 2

LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 2-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 2-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	1.3E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	2.1E-08	4.5E-09				
4	Alpha-chlordan	1.6E-07	3.4E-08				
5	Alpha-endosulf	2.5E-09	5.3E-10				
6	Anthracene	3.6E-07	NA				
7	Benzene	2.0E-08	3.3E-08				
8	Benzo(a)anthra	7.2E-07	NA				
9	Benzo(a)pyrene	7.7E-07	NA				
10	Benzo(b)fluora	7.8E-07	NA				
11	Benzo(g,h,i)pe	7.0E-07	NA				
12	Benzo(k)fluora	7.2E-07	NA				
13	Beta-endosulfa	2.0E-08	4.2E-09				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	4.1E-07	8.5E-08				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	3.5E-07	7.3E-08				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	5.1E-07	NA				
20	Cyanide (free)	2.8E-07	1.8E-07				
21	DDD, 4,4'-	5.2E-08	1.1E-08				
22	DDE, 4,4'-	9.1E-08	1.9E-08				
23	DDT, 4,4'-	1.1E-07	2.3E-08				
24	Dibenz(a,h)ant	1.6E-07	NA				
25	Dieldrin	7.4E-08	1.5E-08				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	6.5E-08	1.4E-08				
28	Fluoranthene	8.8E-07	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	1.7E-07	3.5E-08				
31	Gamma-hexachlo	5.5E-09	1.2E-09				
32	Heptachlor	1.2E-08	2.5E-09				
33	Heptachlor epo	3.8E-08	8.1E-09				
34	Indeno(1,2,3-c	9.9E-07	NA				
35	Lead	1.6E-04	2.0E-05				
36	Mercury, inorg	1.2E-07	2.5E-09				
37	Naphthalene	0.0E+00	NA				
38	Nickel	1.4E-05	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	2.2E-06	4.7E-08				
41	PCB 1260	1.3E-07	1.6E-07				
42	Phenanthrene	1.1E-06	NA				
43	Pyrene	1.1E-06	NA				
44	Silver	3.2E-07	6.8E-08				
45	Sulfide	1.2E-04	2.4E-06				
46	Tetrachloroeth	8.4E-10	1.8E-09				
47	Tetrazene	0.0E+00	0.0E+00				

LIFETIME RISK SUMMARY

FUTURE
RESIDENT 2

LIFETIME EXCESS CANCER RISK

	CHEMICAL NAME	SCENARIO 1 ZONE 2-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 2-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	4E-07	8E-08				
4	Alpha-chlordan	2E-07	5E-08				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	6E-10	1E-09				
8	Benzo(a)anthra	5E-06	NA				
9	Benzo(a)pyrene	6E-06	NA				
10	Benzo(b)fluora	6E-06	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	5E-06	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	5E-07	9E-08				
18	Chromium (VI)	NA	NA				
19	Chrysene	4E-06	NA				
20	Cyanide (free)	NA	NA				
21	DDD, 4,4'-	1E-08	3E-09				
22	DDE, 4,4'-	3E-08	7E-09				
23	DDT, 4,4'-	4E-08	8E-09				
24	Dibenz(a,h)ant	1E-06	NA				
25	Dieldrin	1E-06	2E-07				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	2E-07	6E-08				
31	Gamma-hexachlo	7E-09	1E-09				
32	Heptachlor	5E-08	1E-08				
33	Heptachlor epo	3E-07	7E-08				
34	Indeno(1,2,3-c	7E-06	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	NA				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	1E-06	1E-06				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	4E-11	9E-11				
47	Tetrazene	NA	NA				

48 Toluene	1.9E-08	4.8E-08	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			4E-05	2E-06	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			4E-05					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP3
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 3

EXPOSURE POINT: ZONE 3-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 4.5E-06
HIFc = 3.0E-06
HIFl = 4.2E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	3.6E-01	4.5E-06	1	1.6E-06	6.0E-01	3E-06	3.6E-01	3.0E-06	1	1.1E-06	6.0E-02	2E-05	3.6E-01	4.2E-07	1	1.5E-07	NA	NA
2	Acenaphthylene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
3	Aldrin	3.9E-03	4.5E-06	1	1.7E-08	3.0E-05	6E-04	3.9E-03	3.0E-06	1	1.2E-08	3.0E-05	4E-04	3.9E-03	4.2E-07	1	1.6E-09	1.7E+01	3E-08
4	Alpha-chlordan	2.5E-02	4.5E-06	1	1.1E-07	6.0E-05	2E-03	2.5E-02	3.0E-06	1	7.6E-08	6.0E-05	1E-03	2.5E-02	4.2E-07	1	1.1E-08	1.3E+00	1E-08
5	Alpha-endosulf	5.7E-03	4.5E-06	1	2.6E-08	2.0E-04	1E-04	5.7E-03	3.0E-06	1	1.7E-08	5.0E-05	3E-04	5.7E-03	4.2E-07	1	2.4E-09	NA	NA
6	Anthracene	1.1E+00	4.5E-06	1	5.0E-06	3.0E+00	2E-06	1.1E+00	3.0E-06	1	3.4E-06	3.0E-01	1E-05	1.1E+00	4.2E-07	1	4.7E-07	NA	NA
7	Benzene	0.0E+00	4.5E-06	1	0.0E+00	5.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	2.2E+00	4.5E-06	1	1.0E-05	4.0E-02	3E-04	2.2E+00	3.0E-06	1	6.7E-06	4.0E-02	2E-04	2.2E+00	4.2E-07	1	9.3E-07	7.3E+00	7E-06
9	Benzo(a)pyrene	2.6E+00	4.5E-06	1	1.2E-05	4.0E-02	3E-04	2.6E+00	3.0E-06	1	7.7E-06	4.0E-02	2E-04	2.6E+00	4.2E-07	1	1.1E-06	7.3E+00	8E-06
10	Benzo(b)fluora	3.0E+00	4.5E-06	1	1.3E-05	4.0E-02	3E-04	3.0E+00	3.0E-06	1	8.9E-06	4.0E-02	2E-04	3.0E+00	4.2E-07	1	1.2E-06	7.3E+00	9E-06
11	Benzo(g,h,i)pe	1.9E+00	4.5E-06	1	8.6E-06	4.0E-02	2E-04	1.9E+00	3.0E-06	1	5.7E-06	4.0E-02	1E-04	1.9E+00	4.2E-07	1	8.0E-07	NA	NA
12	Benzo(k)fluora	2.3E+00	4.5E-06	1	1.0E-05	4.0E-02	3E-04	2.3E+00	3.0E-06	1	6.8E-06	4.0E-02	2E-04	2.3E+00	4.2E-07	1	9.5E-07	7.3E+00	7E-06
13	Beta-endosulfa	1.3E-01	4.5E-06	1	5.7E-07	2.0E-04	3E-03	1.3E-01	3.0E-06	1	3.8E-07	5.0E-05	8E-03	1.3E-01	4.2E-07	1	5.3E-08	NA	NA
14	Boron	--	4.5E-06	1	0.0E+00	9.0E-02	0E+00	--	3.0E-06	1	0.0E+00	9.0E-02	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
15	Cadmium (food	2.8E+00	4.5E-06	1	1.3E-05	NA	NA	2.8E+00	3.0E-06	1	8.4E-06	1.0E-03	8E-03	2.8E+00	4.2E-07	1	1.2E-06	NA	NA
16	Cadmium (wate	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	5.0E-04	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
17	Chlordane	5.2E-01	4.5E-06	1	2.3E-06	6.0E-05	4E-02	5.2E-01	3.0E-06	1	1.5E-06	6.0E-05	3E-02	5.2E-01	4.2E-07	1	2.2E-07	1.3E+00	3E-07
18	Chromium (VI)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
19	Chrysene	2.3E+00	4.5E-06	1	1.1E-05	4.0E-02	3E-04	2.3E+00	3.0E-06	1	7.0E-06	4.0E-02	2E-04	2.3E+00	4.2E-07	1	9.8E-07	7.3E+00	7E-06
20	Cyanide (free)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
21	DDD, 4,4'-	2.9E-02	4.5E-06	1	1.3E-07	NA	NA	2.9E-02	3.0E-06	1	8.8E-08	NA	NA	2.9E-02	4.2E-07	1	1.2E-08	2.4E-01	3E-09
22	DDE, 4,4'-	4.0E-02	4.5E-06	1	1.8E-07	NA	NA	4.0E-02	3.0E-06	1	1.2E-07	NA	NA	4.0E-02	4.2E-07	1	1.7E-08	3.4E-01	6E-09
23	DDT, 4,4'-	1.4E-01	4.5E-06	1	6.3E-07	5.0E-04	1E-03	1.4E-01	3.0E-06	1	4.2E-07	5.0E-04	8E-04	1.4E-01	4.2E-07	1	5.9E-08	3.4E-01	2E-08
24	Dibenz(a,h)ant	2.9E-01	4.5E-06	1	1.3E-06	4.0E-02	3E-05	2.9E-01	3.0E-06	1	8.8E-07	4.0E-02	2E-05	2.9E-01	4.2E-07	1	1.2E-07	7.3E+00	9E-07
25	Dieldrin	2.0E-02	4.5E-06	1	8.9E-08	5.0E-05	2E-03	2.0E-02	3.0E-06	1	6.0E-08	5.0E-05	1E-03	2.0E-02	4.2E-07	1	8.3E-09	1.6E+01	1E-07
26	Dimethylbenzen	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
27	Endrin	7.5E-02	4.5E-06	1	3.4E-07	3.0E-04	1E-03	7.5E-02	3.0E-06	1	2.2E-07	3.0E-04	7E-04	7.5E-02	4.2E-07	1	3.1E-08	NA	NA
28	Fluoranthene	3.0E+00	4.5E-06	1	1.4E-05	4.0E-01	3E-05	3.0E+00	3.0E-06	1	9.1E-06	4.0E-02	2E-04	3.0E+00	4.2E-07	1	1.3E-06	NA	NA
29	Fluorene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	4.5E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	3.0E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	8.8E-03	4.5E-06	1	3.9E-08	3.0E-03	1E-05	8.8E-03	3.0E-06	1	2.6E-08	3.0E-04	9E-05	8.8E-03	4.2E-07	1	3.7E-09	1.3E+00	5E-09
32	Heptachlor	4.5E-03	4.5E-06	1	2.0E-08	5.0E-04	4E-05	4.5E-03	3.0E-06	1	1.4E-08	5.0E-04	3E-05	4.5E-03	4.2E-07	1	1.9E-09	4.5E+00	9E-09
33	Heptachlor epo	1.2E-02	4.5E-06	1	5.2E-08	1.3E-05	4E-03	1.2E-02	3.0E-06	1	3.5E-08	1.3E-05	3E-03	1.2E-02	4.2E-07	1	4.9E-09	9.1E+00	4E-08
34	Indeno(1,2,3-c	2.9E+00	4.5E-06	1	1.3E-05	4.0E-02	3E-04	2.9E+00	3.0E-06	1	8.7E-06	4.0E-02	2E-04	2.9E+00	4.2E-07	1	1.2E-06	7.3E+00	9E-06
35	Lead	2.9E+02	4.5E-06	1	1.3E-03	NA	NA	2.9E+02	3.0E-06	1	8.6E-04	NA	NA	2.9E+02	4.2E-07	1	1.2E-04	NA	NA
36	Mercury, inorg	3.5E-01	4.5E-06	1	1.6E-06	3.0E-04	5E-03	3.5E-01	3.0E-06	1	1.1E-06	3.0E-04	4E-03	3.5E-01	4.2E-07	1	1.5E-07	NA	NA
37	Naphthalene	9.6E-01	4.5E-06	1	4.3E-06	4.0E-02	1E-04	9.6E-01	3.0E-06	1	2.9E-06	4.0E-02	7E-05	9.6E-01	4.2E-07	1	4.0E-07	NA	NA
38	Nickel	9.9E+01	4.5E-06	1	4.4E-04	2.0E-02	2E-02	9.9E+01	3.0E-06	1	3.0E-04	2.0E-02	1E-02	9.9E+01	4.2E-07	1	4.1E-05	NA	NA
39	Nitrate	--	4.5E-06	1	0.0E+00	1.6E+00	0E+00	--	3.0E-06	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
40	Nitrite	--	4.5E-06	1	0.0E+00	1.0E-01	0E+00	--	3.0E-06	1	0.0E+00	1.0E-01	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
41	PCB 1260	1.4E-01	4.5E-06	1	6.1E-07	7.0E-05	9E-03	1.4E-01	3.0E-06	1	4.1E-07	7.0E-05	6E-03	1.4E-01	4.2E-07	1	5.7E-08	7.7E+00	4E-07
42	Phenanthrene	4.3E+00	4.5E-06	1	1.9E-05	4.0E-02	5E-04	4.3E+00	3.0E-06	1	1.3E-05	4.0E-02	3E-04	4.3E+00	4.2E-07	1	1.8E-06	NA	NA
43	Pyrene	3.8E+00	4.5E-06	1	1.7E-05	3.0E-01	6E-05	3.8E+00	3.0E-06	1	1.1E-05	3.0E-02	4E-04	3.8E+00	4.2E-07	1	1.6E-06	NA	NA
44	Silver	4.3E+00	4.5E-06	1	1.9E-05	5.0E-03	4E-03	4.3E+00	3.0E-06	1	1.3E-05	5.0E-03	3E-03	4.3E+00	4.2E-07	1	1.8E-06	NA	NA

45 Sulfide	1.1E+02	4.5E-06	1	4.7E-04	NA	NA	1.1E+02	3.0E-06	1	3.2E-04	NA	NA	1.1E+02	4.2E-07	1	4.4E-05	NA	NA
46 Tetrachloroeth	0.0E+00	4.5E-06	1	0.0E+00	1.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	1.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	NA	NA	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	4.5E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	3.0E-03	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP3
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 3

EXPOSURE POINT: ZONE 3-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: DERMAL

HIFs = 3.6E-05
HIFc = 3.4E-05
HIFl = 8.8E-06

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	3.6E-01	3.6E-05	NA	NA	NA	NA	3.6E-01	3.4E-05	NA	NA	NA	NA	3.6E-01	8.8E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
3	Aldrin	3.9E-03	3.6E-05	1.0E-02	1.4E-09	3.0E-05	5E-05	3.9E-03	3.4E-05	1.0E-02	1.3E-09	3.0E-05	4E-05	3.9E-03	8.8E-06	1.0E-02	3.4E-10	1.7E+01	6E-09
4	Alpha-chlordan	2.5E-02	3.6E-05	1.0E-02	9.1E-09	4.8E-05	2E-04	2.5E-02	3.4E-05	1.0E-02	8.6E-09	4.8E-05	2E-04	2.5E-02	8.8E-06	1.0E-02	2.2E-09	1.6E+00	4E-09
5	Alpha-endosulf	5.7E-03	3.6E-05	1.0E-02	2.1E-09	2.0E-04	1E-05	5.7E-03	3.4E-05	1.0E-02	2.0E-09	5.0E-05	4E-05	5.7E-03	8.8E-06	1.0E-02	5.0E-10	NA	NA
6	Anthracene	1.1E+00	3.6E-05	NA	NA	NA	NA	1.1E+00	3.4E-05	NA	NA	NA	NA	1.1E+00	8.8E-06	NA	NA	NA	NA
7	Benzene	0.0E+00	3.6E-05	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	3.4E-05	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	8.8E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	2.2E+00	3.6E-05	NA	NA	NA	NA	2.2E+00	3.4E-05	NA	NA	NA	NA	2.2E+00	8.8E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	2.6E+00	3.6E-05	NA	NA	NA	NA	2.6E+00	3.4E-05	NA	NA	NA	NA	2.6E+00	8.8E-06	NA	NA	NA	NA
10	Benzo(b)fluora	3.0E+00	3.6E-05	NA	NA	NA	NA	3.0E+00	3.4E-05	NA	NA	NA	NA	3.0E+00	8.8E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	1.9E+00	3.6E-05	NA	NA	NA	NA	1.9E+00	3.4E-05	NA	NA	NA	NA	1.9E+00	8.8E-06	NA	NA	NA	NA
12	Benzo(k)fluora	2.3E+00	3.6E-05	NA	NA	NA	NA	2.3E+00	3.4E-05	NA	NA	NA	NA	2.3E+00	8.8E-06	NA	NA	NA	NA
13	Beta-endosulfa	1.3E-01	3.6E-05	1.0E-02	4.6E-08	2.0E-04	2E-04	1.3E-01	3.4E-05	1.0E-02	4.3E-08	5.0E-05	9E-04	1.3E-01	8.8E-06	1.0E-02	1.1E-08	NA	NA
14	Boron	--	3.6E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	3.4E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	2.8E+00	3.6E-05	1.0E-02	1.0E-06	NA	NA	2.8E+00	3.4E-05	1.0E-02	9.5E-07	2.5E-05	4E-02	2.8E+00	8.8E-06	1.0E-02	2.5E-07	NA	NA
16	Cadmium (wate	--	3.6E-05	NA	NA	NA	NA	--	3.4E-05	NA	NA	2.5E-05	NA	--	8.8E-06	NA	NA	NA	NA
17	Chlordane	5.2E-01	3.6E-05	1.0E-02	1.9E-07	6.0E-05	3E-03	5.2E-01	3.4E-05	1.0E-02	1.8E-07	6.0E-05	3E-03	5.2E-01	8.8E-06	1.0E-02	4.5E-08	1.3E+00	6E-08
18	Chromium (VI)	0.0E+00	3.6E-05	NA	NA	1.0E-03	NA	0.0E+00	3.4E-05	NA	NA	2.5E-04	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
19	Chrysene	2.3E+00	3.6E-05	NA	NA	NA	NA	2.3E+00	3.4E-05	NA	NA	NA	NA	2.3E+00	8.8E-06	NA	NA	NA	NA
20	Cyanide (free)	0.0E+00	3.6E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	8.8E-06	3.0E-02	0.0E+00	NA	NA
21	DDD, 4,4'-	2.9E-02	3.6E-05	1.0E-02	1.1E-08	NA	NA	2.9E-02	3.4E-05	1.0E-02	1.0E-08	NA	NA	2.9E-02	8.8E-06	1.0E-02	2.6E-09	2.4E-01	6E-10
22	DDE, 4,4'-	4.0E-02	3.6E-05	1.0E-02	1.5E-08	NA	NA	4.0E-02	3.4E-05	1.0E-02	1.4E-08	NA	NA	4.0E-02	8.8E-06	1.0E-02	3.6E-09	3.4E-01	1E-09
23	DDT, 4,4'-	1.4E-01	3.6E-05	1.0E-02	5.1E-08	5.0E-04	1E-04	1.4E-01	3.4E-05	1.0E-02	4.8E-08	5.0E-04	1E-04	1.4E-01	8.8E-06	1.0E-02	1.2E-08	3.4E-01	4E-09
24	Dibenz(a,h)ant	2.9E-01	3.6E-05	NA	NA	NA	NA	2.9E-01	3.4E-05	NA	NA	NA	NA	2.9E-01	8.8E-06	NA	NA	NA	NA
25	Dieldrin	2.0E-02	3.6E-05	1.0E-02	7.1E-09	5.0E-05	1E-04	2.0E-02	3.4E-05	1.0E-02	6.8E-09	5.0E-05	1E-04	2.0E-02	8.8E-06	1.0E-02	1.7E-09	1.6E+01	3E-08
26	Dimethylbenzen	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	7.5E-02	3.6E-05	1.0E-02	2.7E-08	3.0E-04	9E-05	7.5E-02	3.4E-05	1.0E-02	2.5E-08	3.0E-04	8E-05	7.5E-02	8.8E-06	1.0E-02	6.6E-09	NA	NA
28	Fluoranthene	3.0E+00	3.6E-05	NA	NA	NA	NA	3.0E+00	3.4E-05	NA	NA	NA	NA	3.0E+00	8.8E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
30	Gamma-chlordan	0.0E+00	3.6E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.6E+00	0E+00
31	Gamma-hexachlo	8.8E-03	3.6E-05	1.0E-02	3.2E-09	3.0E-03	1E-06	8.8E-03	3.4E-05	1.0E-02	3.0E-09	3.0E-04	1E-05	8.8E-03	8.8E-06	1.0E-02	7.7E-10	1.3E+00	1E-09
32	Heptachlor	4.5E-03	3.6E-05	1.0E-02	1.6E-09	5.0E-04	3E-06	4.5E-03	3.4E-05	1.0E-02	1.5E-09	5.0E-04	3E-06	4.5E-03	8.8E-06	1.0E-02	4.0E-10	4.5E+00	2E-09
33	Heptachlor epo	1.2E-02	3.6E-05	1.0E-02	4.2E-09	1.3E-05	3E-04	1.2E-02	3.4E-05	1.0E-02	3.9E-09	1.3E-05	3E-04	1.2E-02	8.8E-06	1.0E-02	1.0E-09	9.1E+00	9E-09
34	Indeno(1,2,3-c	2.9E+00	3.6E-05	NA	NA	NA	NA	2.9E+00	3.4E-05	NA	NA	NA	NA	2.9E+00	8.8E-06	NA	NA	NA	NA
35	Lead	2.9E+02	3.6E-05	6.0E-03	6.2E-05	NA	NA	2.9E+02	3.4E-05	6.0E-03	5.8E-05	NA	NA	2.9E+02	8.8E-06	6.0E-03	1.5E-05	NA	NA
36	Mercury, inorg	3.5E-01	3.6E-05	1.0E-03	1.3E-08	6.0E-06	2E-03	3.5E-01	3.4E-05	1.0E-03	1.2E-08	6.0E-06	2E-03	3.5E-01	8.8E-06	1.0E-03	3.1E-09	NA	NA
37	Naphthalene	9.6E-01	3.6E-05	NA	NA	NA	NA	9.6E-01	3.4E-05	NA	NA	NA	NA	9.6E-01	8.8E-06	NA	NA	NA	NA
38	Nickel	9.9E+01	3.6E-05	NA	NA	1.0E-03	NA	9.9E+01	3.4E-05	NA	NA	1.0E-03	NA	9.9E+01	8.8E-06	NA	NA	NA	NA
39	Nitrate	--	3.6E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	--	3.6E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
41	PCB 1260	1.4E-01	3.6E-05	6.0E-02	2.9E-07	6.7E-05	4E-03	1.4E-01	3.4E-05	6.0E-02	2.8E-07	6.7E-05	4E-03	1.4E-01	8.8E-06	6.0E-02	7.2E-08	8.1E+00	6E-07
42	Phenanthrene	4.3E+00	3.6E-05	NA	NA	NA	NA	4.3E+00	3.4E-05	NA	NA	NA	NA	4.3E+00	8.8E-06	NA	NA	NA	NA
43	Pyrene	3.8E+00	3.6E-05	NA	NA	NA	NA	3.8E+00	3.4E-05	NA	NA	NA	NA	3.8E+00	8.8E-06	NA	NA	NA	NA
44	Silver	4.3E+00	3.6E-05	1.0E-02	1.5E-06	2.5E-04	6E-03	4.3E+00	3.4E-05	1.0E-02	1.4E-06	2.5E-04	6E-03	4.3E+00	8.8E-06	1.0E-02	3.7E-07	NA	NA

45	Sulfide	1.1E+02	3.6E-05	1.0E-03	3.8E-06	NA	NA	1.1E+02	3.4E-05	1.0E-03	3.6E-06	NA	NA	1.1E+02	8.8E-06	1.0E-03	9.3E-07	NA	NA
46	Tetrachloroeth	0.0E+00	3.6E-05	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47	Tetrazene	0.0E+00	3.6E-05	1.0E-02	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-02	0.0E+00	NA	NA	0.0E+00	8.8E-06	1.0E-02	0.0E+00	NA	NA
48	Toluene	0.0E+00	3.6E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	3.6E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	--	3.6E-05	1.0E-03	0.0E+00	NA	NA	--	3.4E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP3
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 3

SUBCHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 3-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 3-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	1.6E-06	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	1.7E-08	1.4E-09				
4	Alpha-chlordan	1.1E-07	9.1E-09				
5	Alpha-endosulf	2.6E-08	2.1E-09				
6	Anthracene	5.0E-06	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	1.0E-05	NA				
9	Benzo(a)pyrene	1.2E-05	NA				
10	Benzo(b)fluora	1.3E-05	NA				
11	Benzo(g,h,i)pe	8.6E-06	NA				
12	Benzo(k)fluora	1.0E-05	NA				
13	Beta-endosulfa	5.7E-07	4.6E-08				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	1.3E-05	1.0E-06				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	2.3E-06	1.9E-07				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	1.1E-05	NA				
20	Cyanide (free)	0.0E+00	0.0E+00				
21	DDD, 4,4'-	1.3E-07	1.1E-08				
22	DDE, 4,4'-	1.8E-07	1.5E-08				
23	DDT, 4,4'-	6.3E-07	5.1E-08				
24	Dibenz(a,h)ant	1.3E-06	NA				
25	Dieldrin	8.9E-08	7.1E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	3.4E-07	2.7E-08				
28	Fluoranthene	1.4E-05	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	0.0E+00	0.0E+00				
31	Gamma-hexachlo	3.9E-08	3.2E-09				
32	Heptachlor	2.0E-08	1.6E-09				
33	Heptachlor epo	5.2E-08	4.2E-09				
34	Indeno(1,2,3-c	1.3E-05	NA				
35	Lead	1.3E-03	6.2E-05				
36	Mercury, inorg	1.6E-06	1.3E-08				
37	Naphthalene	4.3E-06	NA				
38	Nickel	4.4E-04	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	6.1E-07	2.9E-07				
42	Phenanthrene	1.9E-05	NA				
43	Pyrene	1.7E-05	NA				
44	Silver	1.9E-05	1.5E-06				
45	Sulfide	4.7E-04	3.8E-06				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

SUBCHRONIC RISK SUMMARY

FUTURE
RESIDENT 3

SUBCHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 ZONE 3-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 3-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	3E-06	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	6E-04	5E-05				
4	Alpha-chlordan	2E-03	2E-04				
5	Alpha-endosulf	1E-04	1E-05				
6	Anthracene	2E-06	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	3E-04	NA				
9	Benzo(a)pyrene	3E-04	NA				
10	Benzo(b)fluora	3E-04	NA				
11	Benzo(g,h,i)pe	2E-04	NA				
12	Benzo(k)fluora	3E-04	NA				
13	Beta-endosulfa	3E-03	2E-04				
14	Boron	0E+00	0E+00				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	4E-02	3E-03				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	3E-04	NA				
20	Cyanide (free)	0E+00	0E+00				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	1E-03	1E-04				
24	Dibenz(a,h)ant	3E-05	NA				
25	Dieldrin	2E-03	1E-04				
26	Dimethylbenzen	0E+00	0E+00				
27	Endrin	1E-03	9E-05				
28	Fluoranthene	3E-05	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	0E+00	0E+00				
31	Gamma-hexachlo	1E-05	1E-06				
32	Heptachlor	4E-05	3E-06				
33	Heptachlor epo	4E-03	3E-04				
34	Indeno(1,2,3-c	3E-04	NA				
35	Lead	NA	NA				
36	Mercury, inorg	5E-03	2E-03				
37	Naphthalene	1E-04	NA				
38	Nickel	2E-02	NA				
39	Nitrate	0E+00	0E+00				
40	Nitrite	0E+00	0E+00				
41	PCB 1260	9E-03	4E-03				
42	Phenanthrene	5E-04	NA				
43	Pyrene	6E-05	NA				
44	Silver	4E-03	6E-03				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	0E+00	0E+00				
PATHWAY SUM (HI)			9E-02	2E-02	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL			1E-01					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP3
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 3

CHRONIC RISK SUMMARY

FUTURE
RESIDENT 3

		CHRONIC DAILY INTAKE (mg/kg/day)						CHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 3-NON	ZONE 3-NON	0	0	0	0	ZONE 3-NON	ZONE 3-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0	SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0	ORAL	DERMAL	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1.1E-06	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2E-05	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00	NA					0E+00	NA				
3	Aldrin	1.2E-08	1.3E-09					4E-04	4E-05				
4	Alpha-chlordan	7.6E-08	8.6E-09					1E-03	2E-04				
5	Alpha-endosulf	1.7E-08	2.0E-09					3E-04	4E-05				
6	Anthracene	3.4E-06	NA					1E-05	NA				
7	Benzene	0.0E+00	0.0E+00					0E+00	0E+00				
8	Benzo(a)anthra	6.7E-06	NA					2E-04	NA				
9	Benzo(a)pyrene	7.7E-06	NA					2E-04	NA				
10	Benzo(b)fluora	8.9E-06	NA					2E-04	NA				
11	Benzo(g,h,i)pe	5.7E-06	NA					1E-04	NA				
12	Benzo(k)fluora	6.8E-06	NA					2E-04	NA				
13	Beta-endosulfa	3.8E-07	4.3E-08					8E-03	9E-04				
14	Boron	0.0E+00	0.0E+00					0E+00	0E+00				
15	Cadmium (food	8.4E-06	9.5E-07					8E-03	4E-02				
16	Cadmium (wate	0.0E+00	NA					0E+00	NA				
17	Chlordane	1.5E-06	1.8E-07					3E-02	3E-03				
18	Chromium (VI)	0.0E+00	NA					0E+00	NA				
19	Chrysene	7.0E-06	NA					2E-04	NA				
20	Cyanide (free)	0.0E+00	0.0E+00					0E+00	0E+00				
21	DDD, 4,4'-	8.8E-08	1.0E-08					NA	NA				
22	DDE, 4,4'-	1.2E-07	1.4E-08					NA	NA				
23	DDT, 4,4'-	4.2E-07	4.8E-08					8E-04	1E-04				
24	Dibenz(a,h)ant	8.8E-07	NA					2E-05	NA				
25	Dieldrin	6.0E-08	6.8E-09					1E-03	1E-04				
26	Dimethylbenzen	0.0E+00	0.0E+00					0E+00	0E+00				
27	Endrin	2.2E-07	2.5E-08					7E-04	8E-05				
28	Fluoranthene	9.1E-06	NA					2E-04	NA				
29	Fluorene	0.0E+00	NA					0E+00	NA				
30	Gamma-chlordan	0.0E+00	0.0E+00					0E+00	0E+00				
31	Gamma-hexachlo	2.6E-08	3.0E-09					9E-05	1E-05				
32	Heptachlor	1.4E-08	1.5E-09					3E-05	3E-06				
33	Heptachlor epo	3.5E-08	3.9E-09					3E-03	3E-04				
34	Indeno(1,2,3-c	8.7E-06	NA					2E-04	NA				
35	Lead	8.6E-04	5.8E-05					NA	NA				
36	Mercury, inorg	1.1E-06	1.2E-08					4E-03	2E-03				
37	Naphthalene	2.9E-06	NA					7E-05	NA				
38	Nickel	3.0E-04	NA					1E-02	NA				
39	Nitrate	0.0E+00	0.0E+00					0E+00	0E+00				
40	Nitrite	0.0E+00	0.0E+00					0E+00	0E+00				
41	PCB 1260	4.1E-07	2.8E-07					6E-03	4E-03				
42	Phenanthrene	1.3E-05	NA					3E-04	NA				
43	Pyrene	1.1E-05	NA					4E-04	NA				
44	Silver	1.3E-05	1.4E-06					3E-03	6E-03				
45	Sulfide	3.2E-04	3.6E-06					NA	NA				
46	Tetrachloroeth	0.0E+00	0.0E+00					0E+00	0E+00				
47	Tetrazene	0.0E+00	0.0E+00					NA	NA				

48 Toluene	0.0E+00	0.0E+00	0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	0E+00	0E+00				
51 Xylenes (total	0.0E+00	0.0E+00	0E+00	0E+00				
PATHWAY SUM (HI)			8E-02	6E-02	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL			1E-01					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP3
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
RESIDENT 3

LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 3-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 3-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	1.5E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	1.6E-09	3.4E-10				
4	Alpha-chlordan	1.1E-08	2.2E-09				
5	Alpha-endosulf	2.4E-09	5.0E-10				
6	Anthracene	4.7E-07	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	9.3E-07	NA				
9	Benzo(a)pyrene	1.1E-06	NA				
10	Benzo(b)fluora	1.2E-06	NA				
11	Benzo(g,h,i)pe	8.0E-07	NA				
12	Benzo(k)fluora	9.5E-07	NA				
13	Beta-endosulfa	5.3E-08	1.1E-08				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	1.2E-06	2.5E-07				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	2.2E-07	4.5E-08				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	9.8E-07	NA				
20	Cyanide (free)	0.0E+00	0.0E+00				
21	DDD, 4,4'-	1.2E-08	2.6E-09				
22	DDE, 4,4'-	1.7E-08	3.6E-09				
23	DDT, 4,4'-	5.9E-08	1.2E-08				
24	Dibenz(a,h)ant	1.2E-07	NA				
25	Dieldrin	8.3E-09	1.7E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	3.1E-08	6.6E-09				
28	Fluoranthene	1.3E-06	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	0.0E+00	0.0E+00				
31	Gamma-hexachlo	3.7E-09	7.7E-10				
32	Heptachlor	1.9E-09	4.0E-10				
33	Heptachlor epo	4.9E-09	1.0E-09				
34	Indeno(1,2,3-c	1.2E-06	NA				
35	Lead	1.2E-04	1.5E-05				
36	Mercury, inorg	1.5E-07	3.1E-09				
37	Naphthalene	4.0E-07	NA				
38	Nickel	4.1E-05	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	5.7E-08	7.2E-08				
42	Phenanthrene	1.8E-06	NA				
43	Pyrene	1.6E-06	NA				
44	Silver	1.8E-06	3.7E-07				
45	Sulfide	4.4E-05	9.3E-07				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

LIFETIME RISK SUMMARY

FUTURE
RESIDENT 3

LIFETIME EXCESS CANCER RISK

	CHEMICAL NAME	SCENARIO 1 ZONE 3-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 3-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	3E-08	6E-09				
4	Alpha-chlordan	1E-08	4E-09				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	7E-06	NA				
9	Benzo(a)pyrene	8E-06	NA				
10	Benzo(b)fluora	9E-06	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	7E-06	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	3E-07	6E-08				
18	Chromium (VI)	NA	NA				
19	Chrysene	7E-06	NA				
20	Cyanide (free)	NA	NA				
21	DDD, 4,4'-	3E-09	6E-10				
22	DDE, 4,4'-	6E-09	1E-09				
23	DDT, 4,4'-	2E-08	4E-09				
24	Dibenz(a,h)ant	9E-07	NA				
25	Dieldrin	1E-07	3E-08				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	0E+00	0E+00				
31	Gamma-hexachlo	5E-09	1E-09				
32	Heptachlor	9E-09	2E-09				
33	Heptachlor epo	4E-08	9E-09				
34	Indeno(1,2,3-c	9E-06	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	NA				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	4E-07	6E-07				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			5E-05	7E-07	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			5E-05					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 4

EXPOSURE POINT: ZONE 1-EXC
MEDIUM: SOIL (0-12')
ROUTE: ORAL

HIFs = 4.5E-06
HIFc = 3.0E-06
HIFl = 4.2E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	4.5E-06	1	0.0E+00	6.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	6.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	4.5E-06	1	0.0E+00	3.0E-05	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.3E-01	4.5E-06	1	5.9E-07	6.0E-05	1E-02	1.3E-01	3.0E-06	1	4.0E-07	6.0E-05	7E-03	1.3E-01	4.2E-07	1	5.5E-08	1.3E+00	7E-08
5	Alpha-endosulf	0.0E+00	4.5E-06	1	0.0E+00	2.0E-04	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	4.5E-06	1	0.0E+00	3.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	4.5E-06	1	0.0E+00	5.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.2E-01	4.5E-06	1	1.4E-06	4.0E-02	4E-05	3.2E-01	3.0E-06	1	9.5E-07	4.0E-02	2E-05	3.2E-01	4.2E-07	1	1.3E-07	7.3E+00	1E-06
9	Benzo(a)pyrene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	3.9E-01	4.5E-06	1	1.7E-06	4.0E-02	4E-05	3.9E-01	3.0E-06	1	1.2E-06	4.0E-02	3E-05	3.9E-01	4.2E-07	1	1.6E-07	7.3E+00	1E-06
11	Benzo(g,h,i)pe	3.6E-01	4.5E-06	1	1.6E-06	4.0E-02	4E-05	3.6E-01	3.0E-06	1	1.1E-06	4.0E-02	3E-05	3.6E-01	4.2E-07	1	1.5E-07	NA	NA
12	Benzo(k)fluora	3.3E-01	4.5E-06	1	1.5E-06	4.0E-02	4E-05	3.3E-01	3.0E-06	1	9.9E-07	4.0E-02	2E-05	3.3E-01	4.2E-07	1	1.4E-07	7.3E+00	1E-06
13	Beta-endosulfa	3.3E-03	4.5E-06	1	1.5E-08	2.0E-04	7E-05	3.3E-03	3.0E-06	1	1.0E-08	5.0E-05	2E-04	3.3E-03	4.2E-07	1	1.4E-09	NA	NA
14	Boron	--	4.5E-06	1	0.0E+00	9.0E-02	0E+00	--	3.0E-06	1	0.0E+00	9.0E-02	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	1.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
16	Cadmium (wate	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	5.0E-04	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
17	Chlordane	1.3E-01	4.5E-06	1	5.9E-07	6.0E-05	1E-02	1.3E-01	3.0E-06	1	4.0E-07	6.0E-05	7E-03	1.3E-01	4.2E-07	1	5.5E-08	1.3E+00	7E-08
18	Chromium (VI)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
19	Chrysene	2.4E-01	4.5E-06	1	1.1E-06	4.0E-02	3E-05	2.4E-01	3.0E-06	1	7.1E-07	4.0E-02	2E-05	2.4E-01	4.2E-07	1	9.9E-08	7.3E+00	7E-07
20	Cyanide (free)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
21	DDD, 4,4'-	2.0E-02	4.5E-06	1	9.0E-08	NA	NA	2.0E-02	3.0E-06	1	6.0E-08	NA	NA	2.0E-02	4.2E-07	1	8.4E-09	2.4E-01	2E-09
22	DDE, 4,4'-	6.2E-02	4.5E-06	1	2.8E-07	NA	NA	6.2E-02	3.0E-06	1	1.9E-07	NA	NA	6.2E-02	4.2E-07	1	2.6E-08	3.4E-01	9E-09
23	DDT, 4,4'-	6.5E-02	4.5E-06	1	2.9E-07	5.0E-04	6E-04	6.5E-02	3.0E-06	1	1.9E-07	5.0E-04	4E-04	6.5E-02	4.2E-07	1	2.7E-08	3.4E-01	9E-09
24	Dibenz(a,h)ant	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	2.7E-02	4.5E-06	1	1.2E-07	5.0E-05	2E-03	2.7E-02	3.0E-06	1	8.0E-08	5.0E-05	2E-03	2.7E-02	4.2E-07	1	1.1E-08	1.6E+01	2E-07
26	Dimethylbenzen	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
27	Endrin	3.5E-02	4.5E-06	1	1.6E-07	3.0E-04	5E-04	3.5E-02	3.0E-06	1	1.1E-07	3.0E-04	4E-04	3.5E-02	4.2E-07	1	1.5E-08	NA	NA
28	Fluoranthene	6.3E-01	4.5E-06	1	2.8E-06	4.0E-01	7E-06	6.3E-01	3.0E-06	1	1.9E-06	4.0E-02	5E-05	6.3E-01	4.2E-07	1	2.6E-07	NA	NA
29	Fluorene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	4.5E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	3.0E-06	1	0.0E+00	6.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	4.5E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-04	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	3.1E-03	4.5E-06	1	1.4E-08	5.0E-04	3E-05	3.1E-03	3.0E-06	1	9.3E-09	5.0E-04	2E-05	3.1E-03	4.2E-07	1	1.3E-09	4.5E+00	6E-09
33	Heptachlor epo	1.7E-02	4.5E-06	1	7.7E-08	1.3E-05	6E-03	1.7E-02	3.0E-06	1	5.1E-08	1.3E-05	4E-03	1.7E-02	4.2E-07	1	7.2E-09	9.1E+00	7E-08
34	Indeno(1,2,3-c	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	7.3E+00	0E+00
35	Lead	6.4E+01	4.5E-06	1	2.9E-04	NA	NA	6.4E+01	3.0E-06	1	1.9E-04	NA	NA	6.4E+01	4.2E-07	1	2.7E-05	NA	NA
36	Mercury, inorg	9.6E-02	4.5E-06	1	4.3E-07	3.0E-04	1E-03	9.6E-02	3.0E-06	1	2.9E-07	3.0E-04	1E-03	9.6E-02	4.2E-07	1	4.0E-08	NA	NA
37	Naphthalene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
38	Nickel	2.4E+01	4.5E-06	1	1.1E-04	2.0E-02	5E-03	2.4E+01	3.0E-06	1	7.1E-05	2.0E-02	4E-03	2.4E+01	4.2E-07	1	9.9E-06	NA	NA
39	Nitrate	--	4.5E-06	1	0.0E+00	1.6E+00	0E+00	--	3.0E-06	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
40	Nitrite	--	4.5E-06	1	0.0E+00	1.0E-01	0E+00	--	3.0E-06	1	0.0E+00	1.0E-01	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
41	PCB 1260	1.2E-01	4.5E-06	1	5.3E-07	7.0E-05	8E-03	1.2E-01	3.0E-06	1	3.5E-07	7.0E-05	5E-03	1.2E-01	4.2E-07	1	4.9E-08	7.7E+00	4E-07
42	Phenanthrene	4.5E-01	4.5E-06	1	2.0E-06	4.0E-02	5E-05	4.5E-01	3.0E-06	1	1.4E-06	4.0E-02	3E-05	4.5E-01	4.2E-07	1	1.9E-07	NA	NA
43	Pyrene	7.5E-01	4.5E-06	1	3.4E-06	3.0E-01	1E-05	7.5E-01	3.0E-06	1	2.2E-06	3.0E-02	7E-05	7.5E-01	4.2E-07	1	3.1E-07	NA	NA
44	Silver	4.5E-02	4.5E-06	1	2.0E-07	5.0E-03	4E-05	4.5E-02	3.0E-06	1	1.4E-07	5.0E-03	3E-05	4.5E-02	4.2E-07	1	1.9E-08	NA	NA

45 Sulfide	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	4.5E-06	1	0.0E+00	1.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	1.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	4.5E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: RESIDENT 4

EXPOSURE POINT: ZONE 1-EXC
MEDIUM: SOIL (0-12')
ROUTE: DERMAL

HIFs = 3.6E-05
HIFc = 3.4E-05
HIFl = 8.8E-06

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
3	Aldrin	0.0E+00	3.6E-05	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.3E-01	3.6E-05	1.0E-02	4.8E-08	4.8E-05	1E-03	1.3E-01	3.4E-05	1.0E-02	4.5E-08	4.8E-05	9E-04	1.3E-01	8.8E-06	1.0E-02	1.2E-08	1.6E+00	2E-08
5	Alpha-endosulf	0.0E+00	3.6E-05	1.0E-02	0.0E+00	2.0E-04	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	5.0E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	NA	NA
6	Anthracene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
7	Benzene	0.0E+00	3.6E-05	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	3.4E-05	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	8.8E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.2E-01	3.6E-05	NA	NA	NA	NA	3.2E-01	3.4E-05	NA	NA	NA	NA	3.2E-01	8.8E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
10	Benzo(b)fluora	3.9E-01	3.6E-05	NA	NA	NA	NA	3.9E-01	3.4E-05	NA	NA	NA	NA	3.9E-01	8.8E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	3.6E-01	3.6E-05	NA	NA	NA	NA	3.6E-01	3.4E-05	NA	NA	NA	NA	3.6E-01	8.8E-06	NA	NA	NA	NA
12	Benzo(k)fluora	3.3E-01	3.6E-05	NA	NA	NA	NA	3.3E-01	3.4E-05	NA	NA	NA	NA	3.3E-01	8.8E-06	NA	NA	NA	NA
13	Beta-endosulfa	3.3E-03	3.6E-05	1.0E-02	1.2E-09	2.0E-04	6E-06	3.3E-03	3.4E-05	1.0E-02	1.1E-09	5.0E-05	2E-05	3.3E-03	8.8E-06	1.0E-02	2.9E-10	NA	NA
14	Boron	--	3.6E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	3.4E-05	1.0E-03	0.0E+00	9.0E-02	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	3.6E-05	1.0E-02	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-02	0.0E+00	2.5E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	NA	NA
16	Cadmium (wate	--	3.6E-05	NA	NA	NA	NA	--	3.4E-05	NA	NA	2.5E-05	NA	--	8.8E-06	NA	NA	NA	NA
17	Chlordane	1.3E-01	3.6E-05	1.0E-02	4.7E-08	6.0E-05	8E-04	1.3E-01	3.4E-05	1.0E-02	4.5E-08	6.0E-05	7E-04	1.3E-01	8.8E-06	1.0E-02	1.2E-08	1.3E+00	2E-08
18	Chromium (VI)	0.0E+00	3.6E-05	NA	NA	1.0E-03	NA	0.0E+00	3.4E-05	NA	NA	2.5E-04	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
19	Chrysene	2.4E-01	3.6E-05	NA	NA	NA	NA	2.4E-01	3.4E-05	NA	NA	NA	NA	2.4E-01	8.8E-06	NA	NA	NA	NA
20	Cyanide (free)	0.0E+00	3.6E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	8.8E-06	3.0E-02	0.0E+00	NA	NA
21	DDD, 4,4'-	2.0E-02	3.6E-05	1.0E-02	7.2E-09	NA	NA	2.0E-02	3.4E-05	1.0E-02	6.8E-09	NA	NA	2.0E-02	8.8E-06	1.0E-02	1.8E-09	2.4E-01	4E-10
22	DDE, 4,4'-	6.2E-02	3.6E-05	1.0E-02	2.2E-08	NA	NA	6.2E-02	3.4E-05	1.0E-02	2.1E-08	NA	NA	6.2E-02	8.8E-06	1.0E-02	5.5E-09	3.4E-01	2E-09
23	DDT, 4,4'-	6.5E-02	3.6E-05	1.0E-02	2.3E-08	5.0E-04	5E-05	6.5E-02	3.4E-05	1.0E-02	2.2E-08	5.0E-04	4E-05	6.5E-02	8.8E-06	1.0E-02	5.7E-09	3.4E-01	2E-09
24	Dibenz(a,h)ant	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
25	Dieldrin	2.7E-02	3.6E-05	1.0E-02	9.6E-09	5.0E-05	2E-04	2.7E-02	3.4E-05	1.0E-02	9.1E-09	5.0E-05	2E-04	2.7E-02	8.8E-06	1.0E-02	2.3E-09	1.6E+01	4E-08
26	Dimethylbenzen	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	3.5E-02	3.6E-05	1.0E-02	1.3E-08	3.0E-04	4E-05	3.5E-02	3.4E-05	1.0E-02	1.2E-08	3.0E-04	4E-05	3.5E-02	8.8E-06	1.0E-02	3.1E-09	NA	NA
28	Fluoranthene	6.3E-01	3.6E-05	NA	NA	NA	NA	6.3E-01	3.4E-05	NA	NA	NA	NA	6.3E-01	8.8E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
30	Gamma-chlordan	0.0E+00	3.6E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.6E+00	0E+00
31	Gamma-hexachlo	0.0E+00	3.6E-05	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.3E+00	0E+00
32	Heptachlor	3.1E-03	3.6E-05	1.0E-02	1.1E-09	5.0E-04	2E-06	3.1E-03	3.4E-05	1.0E-02	1.1E-09	5.0E-04	2E-06	3.1E-03	8.8E-06	1.0E-02	2.7E-10	4.5E+00	1E-09
33	Heptachlor epo	1.7E-02	3.6E-05	1.0E-02	6.2E-09	1.3E-05	5E-04	1.7E-02	3.4E-05	1.0E-02	5.8E-09	1.3E-05	4E-04	1.7E-02	8.8E-06	1.0E-02	1.5E-09	9.1E+00	1E-08
34	Indeno(1,2,3-c	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
35	Lead	6.4E+01	3.6E-05	6.0E-03	1.4E-05	NA	NA	6.4E+01	3.4E-05	6.0E-03	1.3E-05	NA	NA	6.4E+01	8.8E-06	6.0E-03	3.4E-06	NA	NA
36	Mercury, inorg	9.6E-02	3.6E-05	1.0E-03	3.5E-09	6.0E-06	6E-04	9.6E-02	3.4E-05	1.0E-03	3.3E-09	6.0E-06	5E-04	9.6E-02	8.8E-06	1.0E-03	8.5E-10	NA	NA
37	Naphthalene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
38	Nickel	2.4E+01	3.6E-05	NA	NA	1.0E-03	NA	2.4E+01	3.4E-05	NA	NA	1.0E-03	NA	2.4E+01	8.8E-06	NA	NA	NA	NA
39	Nitrate	--	3.6E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	--	3.6E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.0E-01	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
41	PCB 1260	1.2E-01	3.6E-05	6.0E-02	2.5E-07	6.7E-05	4E-03	1.2E-01	3.4E-05	6.0E-02	2.4E-07	6.7E-05	4E-03	1.2E-01	8.8E-06	6.0E-02	6.2E-08	8.1E+00	5E-07
42	Phenanthrene	4.5E-01	3.6E-05	NA	NA	NA	NA	4.5E-01	3.4E-05	NA	NA	NA	NA	4.5E-01	8.8E-06	NA	NA	NA	NA
43	Pyrene	7.5E-01	3.6E-05	NA	NA	NA	NA	7.5E-01	3.4E-05	NA	NA	NA	NA	7.5E-01	8.8E-06	NA	NA	NA	NA
44	Silver	4.5E-02	3.6E-05	1.0E-02	1.6E-08	2.5E-04	6E-05	4.5E-02	3.4E-05	1.0E-02	1.5E-08	2.5E-04	6E-05	4.5E-02	8.8E-06	1.0E-02	4.0E-09	NA	NA

45 Sulfide	--	3.6E-05	1.0E-03	0.0E+00	NA	NA	--	3.4E-05	1.0E-03	0.0E+00	NA	NA	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	3.6E-05	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	3.6E-05	1.0E-02	0.0E+00	NA	NA	--	3.4E-05	1.0E-02	0.0E+00	NA	NA	--	8.8E-06	1.0E-02	0.0E+00	NA	NA
48 Toluene	0.0E+00	3.6E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	3.6E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	3.6E-05	1.0E-03	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	0.0E+00	8.8E-06	1.0E-03	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: WS3

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 4

EXPOSURE POINT: ZONE 1-EXC
MEDIUM: VEG (0-12')
ROUTE: ORAL

HIFs = 7.8E-04
HIFc = 6.6E-04
HIFl = 1.7E-04

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	7.8E-04	1	0.0E+00	6.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	6.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	7.8E-04	1	0.0E+00	3.0E-05	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.1E-02	7.8E-04	1	8.7E-06	6.0E-05	1E-01	1.1E-02	6.6E-04	1	7.4E-06	6.0E-05	1E-01	1.1E-02	1.7E-04	1	1.9E-06	1.3E+00	2E-06
5	Alpha-endosulf	0.0E+00	7.8E-04	1	0.0E+00	2.0E-04	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	7.8E-04	1	0.0E+00	3.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	7.8E-04	1	0.0E+00	5.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	2.8E-02	7.8E-04	1	2.2E-05	4.0E-02	6E-04	2.8E-02	6.6E-04	1	1.9E-05	4.0E-02	5E-04	2.8E-02	1.7E-04	1	4.8E-06	7.3E+00	4E-05
9	Benzo(a)pyrene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	4.4E-02	7.8E-04	1	3.4E-05	4.0E-02	9E-04	4.4E-02	6.6E-04	1	2.9E-05	4.0E-02	7E-04	4.4E-02	1.7E-04	1	7.5E-06	7.3E+00	5E-05
11	Benzo(g,h,i)pe	6.9E-02	7.8E-04	1	5.3E-05	4.0E-02	1E-03	6.9E-02	6.6E-04	1	4.5E-05	4.0E-02	1E-03	6.9E-02	1.7E-04	1	1.2E-05	NA	NA
12	Benzo(k)fluora	5.5E-02	7.8E-04	1	4.3E-05	4.0E-02	1E-03	5.5E-02	6.6E-04	1	3.6E-05	4.0E-02	9E-04	5.5E-02	1.7E-04	1	9.4E-06	7.3E+00	7E-05
13	Beta-endosulfa	1.1E-04	7.8E-04	1	8.8E-08	2.0E-04	4E-04	1.1E-04	6.6E-04	1	7.5E-08	5.0E-05	1E-03	1.1E-04	1.7E-04	1	1.9E-08	NA	NA
14	Boron	0.0E+00	7.8E-04	1	0.0E+00	9.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	9.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	1.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
16	Cadmium (wate	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	5.0E-04	NA	NA	1.7E-04	1	NA	NA	NA
17	Chlordane	1.1E-02	7.8E-04	1	8.7E-06	6.0E-05	1E-01	1.1E-02	6.6E-04	1	7.4E-06	6.0E-05	1E-01	1.1E-02	1.7E-04	1	1.9E-06	1.3E+00	2E-06
18	Chromium (VI)	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
19	Chrysene	2.1E-02	7.8E-04	1	1.7E-05	4.0E-02	4E-04	2.1E-02	6.6E-04	1	1.4E-05	4.0E-02	4E-04	2.1E-02	1.7E-04	1	3.6E-06	7.3E+00	3E-05
20	Cyanide (free)	NA	7.8E-04	1	NA	2.0E-02	NA	NA	6.6E-04	1	NA	2.0E-02	NA	NA	1.7E-04	1	NA	NA	NA
21	DDD, 4,4'-	1.9E-03	7.8E-04	1	1.5E-06	NA	NA	1.9E-03	6.6E-04	1	1.3E-06	NA	NA	1.9E-03	1.7E-04	1	3.3E-07	2.4E-01	8E-08
22	DDE, 4,4'-	5.7E-03	7.8E-04	1	4.4E-06	NA	NA	5.7E-03	6.6E-04	1	3.8E-06	NA	NA	5.7E-03	1.7E-04	1	9.7E-07	3.4E-01	3E-07
23	DDT, 4,4'-	8.4E-03	7.8E-04	1	6.5E-06	5.0E-04	1E-02	8.4E-03	6.6E-04	1	5.5E-06	5.0E-04	1E-02	8.4E-03	1.7E-04	1	1.4E-06	3.4E-01	5E-07
24	Dibenz(a,h)ant	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	1.4E-03	7.8E-04	1	1.1E-06	5.0E-05	2E-02	1.4E-03	6.6E-04	1	9.1E-07	5.0E-05	2E-02	1.4E-03	1.7E-04	1	2.3E-07	1.6E+01	4E-06
26	Dimethylbenzen	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
27	Endrin	1.8E-03	7.8E-04	1	1.4E-06	3.0E-04	5E-03	1.8E-03	6.6E-04	1	1.2E-06	3.0E-04	4E-03	1.8E-03	1.7E-04	1	3.1E-07	NA	NA
28	Fluoranthene	3.9E-02	7.8E-04	1	3.1E-05	4.0E-01	8E-05	3.9E-02	6.6E-04	1	2.6E-05	4.0E-02	7E-04	3.9E-02	1.7E-04	1	6.7E-06	NA	NA
29	Fluorene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	7.8E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	6.6E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	7.8E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	1.4E-04	7.8E-04	1	1.1E-07	5.0E-04	2E-04	1.4E-04	6.6E-04	1	9.2E-08	5.0E-04	2E-04	1.4E-04	1.7E-04	1	2.4E-08	4.5E+00	1E-07
33	Heptachlor epo	1.3E-03	7.8E-04	1	1.0E-06	1.3E-05	8E-02	1.3E-03	6.6E-04	1	8.9E-07	1.3E-05	7E-02	1.3E-03	1.7E-04	1	2.3E-07	9.1E+00	2E-06
34	Indeno(1,2,3-c	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	7.3E+00	0E+00
35	Lead	6.5E-02	7.8E-04	1	5.0E-05	NA	NA	6.5E-02	6.6E-04	1	4.3E-05	NA	NA	6.5E-02	1.7E-04	1	1.1E-05	NA	NA
36	Mercury, inorg	2.1E-03	7.8E-04	1	1.6E-06	3.0E-04	5E-03	2.1E-03	6.6E-04	1	1.4E-06	3.0E-04	5E-03	2.1E-03	1.7E-04	1	3.5E-07	NA	NA
37	Naphthalene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
38	Nickel	1.2E-01	7.8E-04	1	9.0E-05	2.0E-02	5E-03	1.2E-01	6.6E-04	1	7.6E-05	2.0E-02	4E-03	1.2E-01	1.7E-04	1	2.0E-05	NA	NA
39	Nitrate	0.0E+00	7.8E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
40	Nitrite	0.0E+00	7.8E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
41	PCB 1260	2.0E-02	7.8E-04	1	1.6E-05	7.0E-05	2E-01	2.0E-02	6.6E-04	1	1.3E-05	7.0E-05	2E-01	2.0E-02	1.7E-04	1	3.4E-06	7.7E+00	3E-05
42	Phenanthrene	2.4E-02	7.8E-04	1	1.8E-05	4.0E-02	5E-04	2.4E-02	6.6E-04	1	1.6E-05	4.0E-02	4E-04	2.4E-02	1.7E-04	1	4.0E-06	NA	NA
43	Pyrene	4.5E-02	7.8E-04	1	3.5E-05	3.0E-01	1E-04	4.5E-02	6.6E-04	1	3.0E-05	3.0E-02	1E-03	4.5E-02	1.7E-04	1	7.7E-06	NA	NA
44	Silver	4.7E-04	7.8E-04	1	3.7E-07	5.0E-03	7E-05	4.7E-04	6.6E-04	1	3.1E-07	5.0E-03	6E-05	4.7E-04	1.7E-04	1	8.0E-08	NA	NA

45 Sulfide	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	NA	NA	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	7.8E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	NA	NA	NA	1.7E-04	1	NA	NA	NA
48 Toluene	0.0E+00	7.8E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 4

	CHEMICAL NAME	SUBCHRONIC DAILY INTAKE (mg/kg/day) SCENARIO 1 ZONE 1-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 1-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00			
4	Alpha-chlordan	5.9E-07	4.8E-08	8.7E-06			
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00			
6	Anthracene	0.0E+00	NA	0.0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	1.4E-06	NA	2.2E-05			
9	Benzo(a)pyrene	0.0E+00	NA	0.0E+00			
10	Benzo(b)fluora	1.7E-06	NA	3.4E-05			
11	Benzo(g,h,i)pe	1.6E-06	NA	5.3E-05			
12	Benzo(k)fluora	1.5E-06	NA	4.3E-05			
13	Beta-endosulfa	1.5E-08	1.2E-09	8.8E-08			
14	Boron	0.0E+00	0.0E+00	0.0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	5.9E-07	4.7E-08	8.7E-06			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	1.1E-06	NA	1.7E-05			
20	Cyanide (free)	0.0E+00	0.0E+00	NA			
21	DDD, 4,4'-	9.0E-08	7.2E-09	1.5E-06			
22	DDE, 4,4'-	2.8E-07	2.2E-08	4.4E-06			
23	DDT, 4,4'-	2.9E-07	2.3E-08	6.5E-06			
24	Dibenz(a,h)ant	0.0E+00	NA	0.0E+00			
25	Dieldrin	1.2E-07	9.6E-09	1.1E-06			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.6E-07	1.3E-08	1.4E-06			
28	Fluoranthene	2.8E-06	NA	3.1E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	1.4E-08	1.1E-09	1.1E-07			
33	Heptachlor epo	7.7E-08	6.2E-09	1.0E-06			
34	Indeno(1,2,3-c	0.0E+00	NA	0.0E+00			
35	Lead	2.9E-04	1.4E-05	5.0E-05			
36	Mercury, inorg	4.3E-07	3.5E-09	1.6E-06			
37	Naphthalene	0.0E+00	NA	0.0E+00			
38	Nickel	1.1E-04	NA	9.0E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	0.0E+00	0.0E+00	0.0E+00			
41	PCB 1260	5.3E-07	2.5E-07	1.6E-05			
42	Phenanthrene	2.0E-06	NA	1.8E-05			
43	Pyrene	3.4E-06	NA	3.5E-05			
44	Silver	2.0E-07	1.6E-08	3.7E-07			
45	Sulfide	0.0E+00	0.0E+00	0.0E+00			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	0.0E+00	0.0E+00	NA			

SUBCHRONIC RISK SUMMARY

FUTURE
RESIDENT 4

	CHEMICAL NAME	SUBCHRONIC HAZARD QUOTIENT SCENARIO 1 ZONE 1-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 1-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 1-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0E+00	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	0E+00			
3	Aldrin	0E+00	0E+00	0E+00			
4	Alpha-chlordan	1E-02	1E-03	1E-01			
5	Alpha-endosulf	0E+00	0E+00	0E+00			
6	Anthracene	0E+00	NA	0E+00			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	4E-05	NA	6E-04			
9	Benzo(a)pyrene	0E+00	NA	0E+00			
10	Benzo(b)fluora	4E-05	NA	9E-04			
11	Benzo(g,h,i)pe	4E-05	NA	1E-03			
12	Benzo(k)fluora	4E-05	NA	1E-03			
13	Beta-endosulfa	7E-05	6E-06	4E-04			
14	Boron	0E+00	0E+00	0E+00			
15	Cadmium (food	NA	NA	NA			
16	Cadmium (wate	NA	NA	NA			
17	Chlordane	1E-02	8E-04	1E-01			
18	Chromium (VI)	0E+00	NA	0E+00			
19	Chrysene	3E-05	NA	4E-04			
20	Cyanide (free)	0E+00	0E+00	NA			
21	DDD, 4,4'-	NA	NA	NA			
22	DDE, 4,4'-	NA	NA	NA			
23	DDT, 4,4'-	6E-04	5E-05	1E-02			
24	Dibenz(a,h)ant	0E+00	NA	0E+00			
25	Dieldrin	2E-03	2E-04	2E-02			
26	Dimethylbenzen	0E+00	0E+00	0E+00			
27	Endrin	5E-04	4E-05	5E-03			
28	Fluoranthene	7E-06	NA	8E-05			
29	Fluorene	0E+00	NA	0E+00			
30	Gamma-chlordan	0E+00	0E+00	0E+00			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	3E-05	2E-06	2E-04			
33	Heptachlor epo	6E-03	5E-04	8E-02			
34	Indeno(1,2,3-c	0E+00	NA	0E+00			
35	Lead	NA	NA	NA			
36	Mercury, inorg	1E-03	6E-04	5E-03			
37	Naphthalene	0E+00	NA	0E+00			
38	Nickel	5E-03	NA	5E-03			
39	Nitrate	0E+00	0E+00	0E+00			
40	Nitrite	0E+00	0E+00	0E+00			
41	PCB 1260	8E-03	4E-03	2E-01			
42	Phenanthrene	5E-05	NA	5E-04			
43	Pyrene	1E-05	NA	1E-04			
44	Silver	4E-05	6E-05	7E-05			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
				PATHWAY SUM (HI)	4E-02	7E-03	5E-01	0E+00	0E+00	0E+00
				POPULATION TOTAL	5E-01					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 4

		CHRONIC DAILY INTAKE (mg/kg/day)					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 1-EXC	ZONE 1-EXC	ZONE 1-EXC	0	0	0
		SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
		ORAL	DERMAL	ORAL	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00			
4	Alpha-chlordan	4.0E-07	4.5E-08	7.4E-06			
5	Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00			
6	Anthracene	0.0E+00	NA	0.0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	9.5E-07	NA	1.9E-05			
9	Benzo(a)pyrene	0.0E+00	NA	0.0E+00			
10	Benzo(b)fluora	1.2E-06	NA	2.9E-05			
11	Benzo(g,h,i)pe	1.1E-06	NA	4.5E-05			
12	Benzo(k)fluora	9.9E-07	NA	3.6E-05			
13	Beta-endosulfa	1.0E-08	1.1E-09	7.5E-08			
14	Boron	0.0E+00	0.0E+00	0.0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	4.0E-07	4.5E-08	7.4E-06			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	7.1E-07	NA	1.4E-05			
20	Cyanide (free)	0.0E+00	0.0E+00	NA			
21	DDD, 4,4'-	6.0E-08	6.8E-09	1.3E-06			
22	DDE, 4,4'-	1.9E-07	2.1E-08	3.8E-06			
23	DDT, 4,4'-	1.9E-07	2.2E-08	5.5E-06			
24	Dibenz(a,h)ant	0.0E+00	NA	0.0E+00			
25	Dieldrin	8.0E-08	9.1E-09	9.1E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.1E-07	1.2E-08	1.2E-06			
28	Fluoranthene	1.9E-06	NA	2.6E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	9.3E-09	1.1E-09	9.2E-08			
33	Heptachlor epo	5.1E-08	5.8E-09	8.9E-07			
34	Indeno(1,2,3-c	0.0E+00	NA	0.0E+00			
35	Lead	1.9E-04	1.3E-05	4.3E-05			
36	Mercury, inorg	2.9E-07	3.3E-09	1.4E-06			
37	Naphthalene	0.0E+00	NA	0.0E+00			
38	Nickel	7.1E-05	NA	7.6E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	0.0E+00	0.0E+00	0.0E+00			
41	PCB 1260	3.5E-07	2.4E-07	1.3E-05			
42	Phenanthrene	1.4E-06	NA	1.6E-05			
43	Pyrene	2.2E-06	NA	3.0E-05			
44	Silver	1.4E-07	1.5E-08	3.1E-07			
45	Sulfide	0.0E+00	0.0E+00	0.0E+00			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	0.0E+00	0.0E+00	NA			

CHRONIC RISK SUMMARY

FUTURE
RESIDENT 4

	CHRONIC HAZARD QUOTIENT					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 1-EXC	ZONE 1-EXC	ZONE 1-EXC	0	0	0
	SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
	ORAL	DERMAL	ORAL	0	0	0
	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	0E+00	NA	0E+00	0E+00	0E+00	0E+00
2	0E+00	NA	0E+00			
3	0E+00	0E+00	0E+00			
4	7E-03	9E-04	1E-01			
5	0E+00	0E+00	0E+00			
6	0E+00	NA	0E+00			
7	0E+00	0E+00	0E+00			
8	2E-05	NA	5E-04			
9	0E+00	NA	0E+00			
10	3E-05	NA	7E-04			
11	3E-05	NA	1E-03			
12	2E-05	NA	9E-04			
13	2E-04	2E-05	1E-03			
14	0E+00	0E+00	0E+00			
15	0E+00	0E+00	0E+00			
16	0E+00	NA	NA			
17	7E-03	7E-04	1E-01			
18	0E+00	NA	0E+00			
19	2E-05	NA	4E-04			
20	0E+00	0E+00	NA			
21	NA	NA	NA			
22	NA	NA	NA			
23	4E-04	4E-05	1E-02			
24	0E+00	NA	0E+00			
25	2E-03	2E-04	2E-02			
26	0E+00	0E+00	0E+00			
27	4E-04	4E-05	4E-03			
28	5E-05	NA	7E-04			
29	0E+00	NA	0E+00			
30	0E+00	0E+00	0E+00			
31	0E+00	0E+00	0E+00			
32	2E-05	2E-06	2E-04			
33	4E-03	4E-04	7E-02			
34	0E+00	NA	0E+00			
35	NA	NA	NA			
36	1E-03	5E-04	5E-03			
37	0E+00	NA	0E+00			
38	4E-03	NA	4E-03			
39	0E+00	0E+00	0E+00			
40	0E+00	0E+00	0E+00			
41	5E-03	4E-03	2E-01			
42	3E-05	NA	4E-04			
43	7E-05	NA	1E-03			
44	3E-05	6E-05	6E-05			
45	NA	NA	NA			
46	0E+00	0E+00	0E+00			
47	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
PATHWAY SUM (HI)				3E-02	7E-03	5E-01	0E+00	0E+00	0E+00
POPULATION TOTAL				5E-01					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP4
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
RESIDENT 4

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 1-EXC	ZONE 1-EXC	ZONE 1-EXC	0	0	0
	SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
	ORAL	DERMAL	ORAL	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	0.0E+00	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2 Acenaphthylene	0.0E+00	NA	0.0E+00			
3 Aldrin	0.0E+00	0.0E+00	0.0E+00			
4 Alpha-chlordan	5.5E-08	1.2E-08	1.9E-06			
5 Alpha-endosulf	0.0E+00	0.0E+00	0.0E+00			
6 Anthracene	0.0E+00	NA	0.0E+00			
7 Benzene	0.0E+00	0.0E+00	0.0E+00			
8 Benzo(a)anthra	1.3E-07	NA	4.8E-06			
9 Benzo(a)pyrene	0.0E+00	NA	0.0E+00			
10 Benzo(b)fluora	1.6E-07	NA	7.5E-06			
11 Benzo(g,h,i)pe	1.5E-07	NA	1.2E-05			
12 Benzo(k)fluora	1.4E-07	NA	9.4E-06			
13 Beta-endosulfa	1.4E-09	2.9E-10	1.9E-08			
14 Boron	0.0E+00	0.0E+00	0.0E+00			
15 Cadmium (food	0.0E+00	0.0E+00	0.0E+00			
16 Cadmium (wate	0.0E+00	NA	NA			
17 Chlordane	5.5E-08	1.2E-08	1.9E-06			
18 Chromium (VI)	0.0E+00	NA	0.0E+00			
19 Chrysene	9.9E-08	NA	3.6E-06			
20 Cyanide (free)	0.0E+00	0.0E+00	NA			
21 DDD, 4,4'-	8.4E-09	1.8E-09	3.3E-07			
22 DDE, 4,4'-	2.6E-08	5.5E-09	9.7E-07			
23 DDT, 4,4'-	2.7E-08	5.7E-09	1.4E-06			
24 Dibenz(a,h)ant	0.0E+00	NA	0.0E+00			
25 Dieldrin	1.1E-08	2.3E-09	2.3E-07			
26 Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27 Endrin	1.5E-08	3.1E-09	3.1E-07			
28 Fluoranthene	2.6E-07	NA	6.7E-06			
29 Fluorene	0.0E+00	NA	0.0E+00			
30 Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00			
31 Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32 Heptachlor	1.3E-09	2.7E-10	2.4E-08			
33 Heptachlor epo	7.2E-09	1.5E-09	2.3E-07			
34 Indeno(1,2,3-c	0.0E+00	NA	0.0E+00			
35 Lead	2.7E-05	3.4E-06	1.1E-05			
36 Mercury, inorg	4.0E-08	8.5E-10	3.5E-07			
37 Naphthalene	0.0E+00	NA	0.0E+00			
38 Nickel	9.9E-06	NA	2.0E-05			
39 Nitrate	0.0E+00	0.0E+00	0.0E+00			
40 Nitrite	0.0E+00	0.0E+00	0.0E+00			
41 PCB 1260	4.9E-08	6.2E-08	3.4E-06			
42 Phenanthrene	1.9E-07	NA	4.0E-06			
43 Pyrene	3.1E-07	NA	7.7E-06			
44 Silver	1.9E-08	4.0E-09	8.0E-08			
45 Sulfide	0.0E+00	0.0E+00	0.0E+00			
46 Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47 Tetrazene	0.0E+00	0.0E+00	NA			

LIFETIME RISK SUMMARY

FUTURE
RESIDENT 4

	LIFETIME EXCESS CANCER RISK					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 1-EXC	ZONE 1-EXC	ZONE 1-EXC	0	0	0
	SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
	ORAL	DERMAL	ORAL	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	NA	NA	NA	0E+00	0E+00	0E+00
2 Acenaphthylene	NA	NA	NA			
3 Aldrin	0E+00	0E+00	0E+00			
4 Alpha-chlordan	7E-08	2E-08	2E-06			
5 Alpha-endosulf	NA	NA	NA			
6 Anthracene	NA	NA	NA			
7 Benzene	0E+00	0E+00	0E+00			
8 Benzo(a)anthra	1E-06	NA	4E-05			
9 Benzo(a)pyrene	0E+00	NA	0E+00			
10 Benzo(b)fluora	1E-06	NA	5E-05			
11 Benzo(g,h,i)pe	NA	NA	NA			
12 Benzo(k)fluora	1E-06	NA	7E-05			
13 Beta-endosulfa	NA	NA	NA			
14 Boron	NA	NA	NA			
15 Cadmium (food	NA	NA	NA			
16 Cadmium (wate	NA	NA	NA			
17 Chlordane	7E-08	2E-08	2E-06			
18 Chromium (VI)	NA	NA	NA			
19 Chrysene	7E-07	NA	3E-05			
20 Cyanide (free)	NA	NA	NA			
21 DDD, 4,4'-	2E-09	4E-10	8E-08			
22 DDE, 4,4'-	9E-09	2E-09	3E-07			
23 DDT, 4,4'-	9E-09	2E-09	5E-07			
24 Dibenz(a,h)ant	0E+00	NA	0E+00			
25 Dieldrin	2E-07	4E-08	4E-06			
26 Dimethylbenzen	NA	NA	NA			
27 Endrin	NA	NA	NA			
28 Fluoranthene	NA	NA	NA			
29 Fluorene	NA	NA	NA			
30 Gamma-chlordan	0E+00	0E+00	0E+00			
31 Gamma-hexachlo	0E+00	0E+00	0E+00			
32 Heptachlor	6E-09	1E-09	1E-07			
33 Heptachlor epo	7E-08	1E-08	2E-06			
34 Indeno(1,2,3-c	0E+00	NA	0E+00			
35 Lead	NA	NA	NA			
36 Mercury, inorg	NA	NA	NA			
37 Naphthalene	NA	NA	NA			
38 Nickel	NA	NA	NA			
39 Nitrate	NA	NA	NA			
40 Nitrite	NA	NA	NA			
41 PCB 1260	4E-07	5E-07	3E-05			
42 Phenanthrene	NA	NA	NA			
43 Pyrene	NA	NA	NA			
44 Silver	NA	NA	NA			
45 Sulfide	NA	NA	NA			
46 Tetrachloroeth	0E+00	0E+00	0E+00			
47 Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
TOTAL PATHWAY CANCER RISK				5E-06	6E-07	2E-04	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK				2E-04					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 5

EXPOSURE POINT: ZONE 4-EXC
MEDIUM: SOIL (0-12')
ROUTE: ORAL

HIFs = 4.5E-06
HIFc = 3.0E-06
HIFl = 4.2E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	4.3E-01	4.5E-06	1	1.9E-06	6.0E-01	3E-06	4.3E-01	3.0E-06	1	1.3E-06	6.0E-02	2E-05	4.3E-01	4.2E-07	1	1.8E-07	NA	NA
2	Acenaphthylene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
3	Aldrin	7.6E-03	4.5E-06	1	3.4E-08	3.0E-05	1E-03	7.6E-03	3.0E-06	1	2.3E-08	3.0E-05	8E-04	7.6E-03	4.2E-07	1	3.2E-09	1.7E+01	5E-08
4	Alpha-chlordan	2.9E-02	4.5E-06	1	1.3E-07	6.0E-05	2E-03	2.9E-02	3.0E-06	1	8.7E-08	6.0E-05	1E-03	2.9E-02	4.2E-07	1	1.2E-08	1.3E+00	2E-08
5	Alpha-endosulf	6.8E-03	4.5E-06	1	3.1E-08	2.0E-04	2E-04	6.8E-03	3.0E-06	1	2.0E-08	5.0E-05	4E-04	6.8E-03	4.2E-07	1	2.9E-09	NA	NA
6	Anthracene	1.1E+00	4.5E-06	1	5.1E-06	3.0E+00	2E-06	1.1E+00	3.0E-06	1	3.4E-06	3.0E-01	1E-05	1.1E+00	4.2E-07	1	4.7E-07	NA	NA
7	Benzene	0.0E+00	4.5E-06	1	0.0E+00	5.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	7.8E-01	4.5E-06	1	3.5E-06	4.0E-02	9E-05	7.8E-01	3.0E-06	1	2.3E-06	4.0E-02	6E-05	7.8E-01	4.2E-07	1	3.3E-07	7.3E+00	2E-06
9	Benzo(a)pyrene	9.4E-01	4.5E-06	1	4.2E-06	4.0E-02	1E-04	9.4E-01	3.0E-06	1	2.8E-06	4.0E-02	7E-05	9.4E-01	4.2E-07	1	3.9E-07	7.3E+00	3E-06
10	Benzo(b)fluora	6.6E-01	4.5E-06	1	3.0E-06	4.0E-02	7E-05	6.6E-01	3.0E-06	1	2.0E-06	4.0E-02	5E-05	6.6E-01	4.2E-07	1	2.8E-07	7.3E+00	2E-06
11	Benzo(g,h,i)pe	5.6E-01	4.5E-06	1	2.5E-06	4.0E-02	6E-05	5.6E-01	3.0E-06	1	1.7E-06	4.0E-02	4E-05	5.6E-01	4.2E-07	1	2.4E-07	NA	NA
12	Benzo(k)fluora	5.9E-01	4.5E-06	1	2.7E-06	4.0E-02	7E-05	5.9E-01	3.0E-06	1	1.8E-06	4.0E-02	4E-05	5.9E-01	4.2E-07	1	2.5E-07	7.3E+00	2E-06
13	Beta-endosulfa	6.3E-03	4.5E-06	1	2.8E-08	2.0E-04	1E-04	6.3E-03	3.0E-06	1	1.9E-08	5.0E-05	4E-04	6.3E-03	4.2E-07	1	2.6E-09	NA	NA
14	Boron	1.1E+01	4.5E-06	1	4.8E-05	9.0E-02	5E-04	1.1E+01	3.0E-06	1	3.2E-05	9.0E-02	4E-04	1.1E+01	4.2E-07	1	4.5E-06	NA	NA
15	Cadmium (food	6.9E-01	4.5E-06	1	3.1E-06	NA	NA	6.9E-01	3.0E-06	1	2.1E-06	1.0E-03	2E-03	6.9E-01	4.2E-07	1	2.9E-07	NA	NA
16	Cadmium (wate	--	4.5E-06	1	0.0E+00	NA	NA	--	3.0E-06	1	0.0E+00	5.0E-04	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
17	Chlordane	9.9E-01	4.5E-06	1	4.5E-06	6.0E-05	7E-02	9.9E-01	3.0E-06	1	3.0E-06	6.0E-05	5E-02	9.9E-01	4.2E-07	1	4.2E-07	1.3E+00	5E-07
18	Chromium (VI)	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
19	Chrysene	9.9E-01	4.5E-06	1	4.5E-06	4.0E-02	1E-04	9.9E-01	3.0E-06	1	3.0E-06	4.0E-02	7E-05	9.9E-01	4.2E-07	1	4.2E-07	7.3E+00	3E-06
20	Cyanide (free)	3.2E-01	4.5E-06	1	1.4E-06	2.0E-02	7E-05	3.2E-01	3.0E-06	1	9.6E-07	2.0E-02	5E-05	3.2E-01	4.2E-07	1	1.3E-07	NA	NA
21	DDD, 4,4'-	1.2E-01	4.5E-06	1	5.6E-07	NA	NA	1.2E-01	3.0E-06	1	3.7E-07	NA	NA	1.2E-01	4.2E-07	1	5.2E-08	2.4E-01	1E-08
22	DDE, 4,4'-	2.4E-01	4.5E-06	1	1.1E-06	NA	NA	2.4E-01	3.0E-06	1	7.1E-07	NA	NA	2.4E-01	4.2E-07	1	9.9E-08	3.4E-01	3E-08
23	DDT, 4,4'-	6.2E-01	4.5E-06	1	2.8E-06	5.0E-04	6E-03	6.2E-01	3.0E-06	1	1.9E-06	5.0E-04	4E-03	6.2E-01	4.2E-07	1	2.6E-07	3.4E-01	9E-08
24	Dibenz(a,h)ant	2.3E-01	4.5E-06	1	1.0E-06	4.0E-02	3E-05	2.3E-01	3.0E-06	1	6.8E-07	4.0E-02	2E-05	2.3E-01	4.2E-07	1	9.5E-08	7.3E+00	7E-07
25	Dieldrin	2.2E-02	4.5E-06	1	1.0E-07	5.0E-05	2E-03	2.2E-02	3.0E-06	1	6.7E-08	5.0E-05	1E-03	2.2E-02	4.2E-07	1	9.4E-09	1.6E+01	1E-07
26	Dimethylbenzen	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
27	Endrin	3.0E-01	4.5E-06	1	1.3E-06	3.0E-04	4E-03	3.0E-01	3.0E-06	1	9.0E-07	3.0E-04	3E-03	3.0E-01	4.2E-07	1	1.3E-07	NA	NA
28	Fluoranthene	1.6E+00	4.5E-06	1	7.3E-06	4.0E-01	2E-05	1.6E+00	3.0E-06	1	4.9E-06	4.0E-02	1E-04	1.6E+00	4.2E-07	1	6.8E-07	NA	NA
29	Fluorene	0.0E+00	4.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	3.2E-02	4.5E-06	1	1.4E-07	6.0E-05	2E-03	3.2E-02	3.0E-06	1	9.5E-08	6.0E-05	2E-03	3.2E-02	4.2E-07	1	1.3E-08	1.3E+00	2E-08
31	Gamma-hexachlo	0.0E+00	4.5E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	3.0E-06	1	0.0E+00	3.0E-04	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	4.5E-06	1	0.0E+00	5.0E-04	0E+00	0.0E+00	3.0E-06	1	0.0E+00	5.0E-04	0E+00	0.0E+00	4.2E-07	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	6.3E-02	4.5E-06	1	2.8E-07	1.3E-05	2E-02	6.3E-02	3.0E-06	1	1.9E-07	1.3E-05	1E-02	6.3E-02	4.2E-07	1	2.6E-08	9.1E+00	2E-07
34	Indeno(1,2,3-c	3.2E-01	4.5E-06	1	1.4E-06	4.0E-02	4E-05	3.2E-01	3.0E-06	1	9.7E-07	4.0E-02	2E-05	3.2E-01	4.2E-07	1	1.4E-07	7.3E+00	1E-06
35	Lead	1.7E+02	4.5E-06	1	7.5E-04	NA	NA	1.7E+02	3.0E-06	1	5.0E-04	NA	NA	1.7E+02	4.2E-07	1	7.0E-05	NA	NA
36	Mercury, inorg	1.9E-01	4.5E-06	1	8.4E-07	3.0E-04	3E-03	1.9E-01	3.0E-06	1	5.6E-07	3.0E-04	2E-03	1.9E-01	4.2E-07	1	7.9E-08	NA	NA
37	Naphthalene	5.5E-01	4.5E-06	1	2.5E-06	4.0E-02	6E-05	5.5E-01	3.0E-06	1	1.7E-06	4.0E-02	4E-05	5.5E-01	4.2E-07	1	2.3E-07	NA	NA
38	Nickel	1.7E+01	4.5E-06	1	7.8E-05	2.0E-02	4E-03	1.7E+01	3.0E-06	1	5.2E-05	2.0E-02	3E-03	1.7E+01	4.2E-07	1	7.3E-06	NA	NA
39	Nitrate	--	4.5E-06	1	0.0E+00	1.6E+00	0E+00	--	3.0E-06	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	NA	NA
40	Nitrite	5.7E+00	4.5E-06	1	2.5E-05	1.0E-01	3E-04	5.7E+00	3.0E-06	1	1.7E-05	1.0E-01	2E-04	5.7E+00	4.2E-07	1	2.4E-06	NA	NA
41	PCB 1260	4.4E-01	4.5E-06	1	2.0E-06	7.0E-05	3E-02	4.4E-01	3.0E-06	1	1.3E-06	7.0E-05	2E-02	4.4E-01	4.2E-07	1	1.8E-07	7.7E+00	1E-06
42	Phenanthrene	4.6E-01	4.5E-06	1	2.1E-06	4.0E-02	5E-05	4.6E-01	3.0E-06	1	1.4E-06	4.0E-02	3E-05	4.6E-01	4.2E-07	1	1.9E-07	NA	NA
43	Pyrene	2.2E+00	4.5E-06	1	1.0E-05	3.0E-01	3E-05	2.2E+00	3.0E-06	1	6.7E-06	3.0E-02	2E-04	2.2E+00	4.2E-07	1	9.4E-07	NA	NA
44	Silver	5.5E-02	4.5E-06	1	2.5E-07	5.0E-03	5E-05	5.5E-02	3.0E-06	1	1.7E-07	5.0E-03	3E-05	5.5E-02	4.2E-07	1	2.3E-08	NA	NA

45 Sulfide	2.6E+02	4.5E-06	1	1.2E-03	NA	NA	2.6E+02	3.0E-06	1	7.9E-04	NA	NA	2.6E+02	4.2E-07	1	1.1E-04	NA	NA
46 Tetrachloroeth	0.0E+00	4.5E-06	1	0.0E+00	1.0E-01	0E+00	0.0E+00	3.0E-06	1	0.0E+00	1.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	1.0E+00	4.5E-06	1	4.6E-06	NA	NA	1.0E+00	3.0E-06	1	3.0E-06	NA	NA	1.0E+00	4.2E-07	1	4.3E-07	NA	NA
48 Toluene	0.0E+00	4.5E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	4.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	4.5E-06	1	0.0E+00	NA	NA	0.0E+00	3.0E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	4.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	3.0E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: RESIDENT 5

EXPOSURE POINT: ZONE 4-EXC
MEDIUM: SOIL (0-12')
ROUTE: DERMAL

HIFs = 3.6E-05
HIFc = 3.4E-05
HIFl = 8.8E-06

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	4.3E-01	3.6E-05	NA	NA	NA	NA	4.3E-01	3.4E-05	NA	NA	NA	NA	4.3E-01	8.8E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
3	Aldrin	7.6E-03	3.6E-05	1.0E-02	2.7E-09	3.0E-05	9E-05	7.6E-03	3.4E-05	1.0E-02	2.6E-09	3.0E-05	9E-05	7.6E-03	8.8E-06	1.0E-02	6.7E-10	1.7E+01	1E-08
4	Alpha-chlordan	2.9E-02	3.6E-05	1.0E-02	1.0E-08	4.8E-05	2E-04	2.9E-02	3.4E-05	1.0E-02	9.9E-09	4.8E-05	2E-04	2.9E-02	8.8E-06	1.0E-02	2.6E-09	1.6E+00	4E-09
5	Alpha-endosulf	6.8E-03	3.6E-05	1.0E-02	2.5E-09	2.0E-04	1E-05	6.8E-03	3.4E-05	1.0E-02	2.3E-09	5.0E-05	5E-05	6.8E-03	8.8E-06	1.0E-02	6.0E-10	NA	NA
6	Anthracene	1.1E+00	3.6E-05	NA	NA	NA	NA	1.1E+00	3.4E-05	NA	NA	NA	NA	1.1E+00	8.8E-06	NA	NA	NA	NA
7	Benzene	0.0E+00	3.6E-05	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	3.4E-05	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	8.8E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	7.8E-01	3.6E-05	NA	NA	NA	NA	7.8E-01	3.4E-05	NA	NA	NA	NA	7.8E-01	8.8E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	9.4E-01	3.6E-05	NA	NA	NA	NA	9.4E-01	3.4E-05	NA	NA	NA	NA	9.4E-01	8.8E-06	NA	NA	NA	NA
10	Benzo(b)fluora	6.6E-01	3.6E-05	NA	NA	NA	NA	6.6E-01	3.4E-05	NA	NA	NA	NA	6.6E-01	8.8E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	5.6E-01	3.6E-05	NA	NA	NA	NA	5.6E-01	3.4E-05	NA	NA	NA	NA	5.6E-01	8.8E-06	NA	NA	NA	NA
12	Benzo(k)fluora	5.9E-01	3.6E-05	NA	NA	NA	NA	5.9E-01	3.4E-05	NA	NA	NA	NA	5.9E-01	8.8E-06	NA	NA	NA	NA
13	Beta-endosulfa	6.3E-03	3.6E-05	1.0E-02	2.3E-09	2.0E-04	1E-05	6.3E-03	3.4E-05	1.0E-02	2.1E-09	5.0E-05	4E-05	6.3E-03	8.8E-06	1.0E-02	5.5E-10	NA	NA
14	Boron	1.1E+01	3.6E-05	1.0E-03	3.8E-07	9.0E-02	4E-06	1.1E+01	3.4E-05	1.0E-03	3.6E-07	9.0E-02	4E-06	1.1E+01	8.8E-06	1.0E-03	9.3E-08	NA	NA
15	Cadmium (food	6.9E-01	3.6E-05	1.0E-02	2.5E-07	NA	NA	6.9E-01	3.4E-05	1.0E-02	2.3E-07	2.5E-05	9E-03	6.9E-01	8.8E-06	1.0E-02	6.1E-08	NA	NA
16	Cadmium (wate	--	3.6E-05	NA	NA	NA	NA	--	3.4E-05	NA	NA	2.5E-05	NA	--	8.8E-06	NA	NA	NA	NA
17	Chlordane	9.9E-01	3.6E-05	1.0E-02	3.6E-07	6.0E-05	6E-03	9.9E-01	3.4E-05	1.0E-02	3.4E-07	6.0E-05	6E-03	9.9E-01	8.8E-06	1.0E-02	8.7E-08	1.3E+00	1E-07
18	Chromium (VI)	0.0E+00	3.6E-05	NA	NA	1.0E-03	NA	0.0E+00	3.4E-05	NA	NA	2.5E-04	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
19	Chrysene	9.9E-01	3.6E-05	NA	NA	NA	NA	9.9E-01	3.4E-05	NA	NA	NA	NA	9.9E-01	8.8E-06	NA	NA	NA	NA
20	Cyanide (free)	3.2E-01	3.6E-05	3.0E-02	3.4E-07	2.0E-02	2E-05	3.2E-01	3.4E-05	3.0E-02	3.3E-07	2.0E-02	2E-05	3.2E-01	8.8E-06	3.0E-02	8.4E-08	NA	NA
21	DDD, 4,4'-	1.2E-01	3.6E-05	1.0E-02	4.4E-08	NA	NA	1.2E-01	3.4E-05	1.0E-02	4.2E-08	NA	NA	1.2E-01	8.8E-06	1.0E-02	1.1E-08	2.4E-01	3E-09
22	DDE, 4,4'-	2.4E-01	3.6E-05	1.0E-02	8.5E-08	NA	NA	2.4E-01	3.4E-05	1.0E-02	8.0E-08	NA	NA	2.4E-01	8.8E-06	1.0E-02	2.1E-08	3.4E-01	7E-09
23	DDT, 4,4'-	6.2E-01	3.6E-05	1.0E-02	2.2E-07	5.0E-04	4E-04	6.2E-01	3.4E-05	1.0E-02	2.1E-07	5.0E-04	4E-04	6.2E-01	8.8E-06	1.0E-02	5.5E-08	3.4E-01	2E-08
24	Dibenz(a,h)ant	2.3E-01	3.6E-05	NA	NA	NA	NA	2.3E-01	3.4E-05	NA	NA	NA	NA	2.3E-01	8.8E-06	NA	NA	NA	NA
25	Dieldrin	2.2E-02	3.6E-05	1.0E-02	8.0E-09	5.0E-05	2E-04	2.2E-02	3.4E-05	1.0E-02	7.6E-09	5.0E-05	2E-04	2.2E-02	8.8E-06	1.0E-02	2.0E-09	1.6E+01	3E-08
26	Dimethylbenzen	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	3.0E-01	3.6E-05	1.0E-02	1.1E-07	3.0E-04	4E-04	3.0E-01	3.4E-05	1.0E-02	1.0E-07	3.0E-04	3E-04	3.0E-01	8.8E-06	1.0E-02	2.6E-08	NA	NA
28	Fluoranthene	1.6E+00	3.6E-05	NA	NA	NA	NA	1.6E+00	3.4E-05	NA	NA	NA	NA	1.6E+00	8.8E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	3.6E-05	NA	NA	NA	NA	0.0E+00	3.4E-05	NA	NA	NA	NA	0.0E+00	8.8E-06	NA	NA	NA	NA
30	Gamma-chlordan	3.2E-02	3.6E-05	1.0E-02	1.1E-08	4.8E-05	2E-04	3.2E-02	3.4E-05	1.0E-02	1.1E-08	4.8E-05	2E-04	3.2E-02	8.8E-06	1.0E-02	2.8E-09	1.6E+00	5E-09
31	Gamma-hexachlo	0.0E+00	3.6E-05	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	3.6E-05	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	3.4E-05	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	8.8E-06	1.0E-02	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	6.3E-02	3.6E-05	1.0E-02	2.3E-08	1.3E-05	2E-03	6.3E-02	3.4E-05	1.0E-02	2.1E-08	1.3E-05	2E-03	6.3E-02	8.8E-06	1.0E-02	5.5E-09	9.1E+00	5E-08
34	Indeno(1,2,3-c	3.2E-01	3.6E-05	NA	NA	NA	NA	3.2E-01	3.4E-05	NA	NA	NA	NA	3.2E-01	8.8E-06	NA	NA	NA	NA
35	Lead	1.7E+02	3.6E-05	6.0E-03	3.6E-05	NA	NA	1.7E+02	3.4E-05	6.0E-03	3.4E-05	NA	NA	1.7E+02	8.8E-06	6.0E-03	8.8E-06	NA	NA
36	Mercury, inorg	1.9E-01	3.6E-05	1.0E-03	6.7E-09	6.0E-06	1E-03	1.9E-01	3.4E-05	1.0E-03	6.4E-09	6.0E-06	1E-03	1.9E-01	8.8E-06	1.0E-03	1.6E-09	NA	NA
37	Naphthalene	5.5E-01	3.6E-05	NA	NA	NA	NA	5.5E-01	3.4E-05	NA	NA	NA	NA	5.5E-01	8.8E-06	NA	NA	NA	NA
38	Nickel	1.7E+01	3.6E-05	NA	NA	1.0E-03	NA	1.7E+01	3.4E-05	NA	NA	1.0E-03	NA	1.7E+01	8.8E-06	NA	NA	NA	NA
39	Nitrate	--	3.6E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	3.4E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.8E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	5.7E+00	3.6E-05	1.0E-03	2.0E-07	1.0E-01	2E-06	5.7E+00	3.4E-05	1.0E-03	1.9E-07	1.0E-01	2E-06	5.7E+00	8.8E-06	1.0E-03	5.0E-08	NA	NA
41	PCB 1260	4.4E-01	3.6E-05	6.0E-02	9.5E-07	6.7E-05	1E-02	4.4E-01	3.4E-05	6.0E-02	9.0E-07	6.7E-05	1E-02	4.4E-01	8.8E-06	6.0E-02	2.3E-07	8.1E+00	2E-06
42	Phenanthrene	4.6E-01	3.6E-05	NA	NA	NA	NA	4.6E-01	3.4E-05	NA	NA	NA	NA	4.6E-01	8.8E-06	NA	NA	NA	NA
43	Pyrene	2.2E+00	3.6E-05	NA	NA	NA	NA	2.2E+00	3.4E-05	NA	NA	NA	NA	2.2E+00	8.8E-06	NA	NA	NA	NA
44	Silver	5.5E-02	3.6E-05	1.0E-02	2.0E-08	2.5E-04	8E-05	5.5E-02	3.4E-05	1.0E-02	1.9E-08	2.5E-04	7E-05	5.5E-02	8.8E-06	1.0E-02	4.8E-09	NA	NA

45 Sulfide	2.6E+02	3.6E-05	1.0E-03	9.5E-06	NA	NA	2.6E+02	3.4E-05	1.0E-03	9.0E-06	NA	NA	2.6E+02	8.8E-06	1.0E-03	2.3E-06	NA	NA
46 Tetrachloroeth	0.0E+00	3.6E-05	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47 Tetrazene	1.0E+00	3.6E-05	1.0E-02	3.7E-07	NA	NA	1.0E+00	3.4E-05	1.0E-02	3.5E-07	NA	NA	1.0E+00	8.8E-06	1.0E-02	8.9E-08	NA	NA
48 Toluene	0.0E+00	3.6E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	3.6E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	3.4E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	8.8E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	3.6E-05	1.0E-03	0.0E+00	NA	NA	0.0E+00	3.4E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	0.0E+00	8.8E-06	1.0E-03	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	3.6E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	3.4E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.8E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: WS3

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: RESIDENT 5

EXPOSURE POINT: ZONE 4-EXC
MEDIUM: VEG (0-12')
ROUTE: ORAL

HIFs = 7.8E-04
HIFc = 6.6E-04
HIFl = 1.7E-04

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	1.7E-02	7.8E-04	1	1.3E-05	6.0E-01	2E-05	1.7E-02	6.6E-04	1	1.1E-05	6.0E-02	2E-04	1.7E-02	1.7E-04	1	2.8E-06	NA	NA
2	Acenaphthylene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
3	Aldrin	2.3E-04	7.8E-04	1	1.8E-07	3.0E-05	6E-03	2.3E-04	6.6E-04	1	1.6E-07	3.0E-05	5E-03	2.3E-04	1.7E-04	1	4.0E-08	1.7E+01	7E-07
4	Alpha-chlordan	2.5E-03	7.8E-04	1	1.9E-06	6.0E-05	3E-02	2.5E-03	6.6E-04	1	1.6E-06	6.0E-05	3E-02	2.5E-03	1.7E-04	1	4.2E-07	1.3E+00	5E-07
5	Alpha-endosulf	2.3E-04	7.8E-04	1	1.8E-07	2.0E-04	9E-04	2.3E-04	6.6E-04	1	1.5E-07	5.0E-05	3E-03	2.3E-04	1.7E-04	1	3.9E-08	NA	NA
6	Anthracene	5.8E-02	7.8E-04	1	4.5E-05	3.0E+00	2E-05	5.8E-02	6.6E-04	1	3.8E-05	3.0E-01	1E-04	5.8E-02	1.7E-04	1	9.9E-06	NA	NA
7	Benzene	0.0E+00	7.8E-04	1	0.0E+00	5.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	7.0E-02	7.8E-04	1	5.4E-05	4.0E-02	1E-03	7.0E-02	6.6E-04	1	4.6E-05	4.0E-02	1E-03	7.0E-02	1.7E-04	1	1.2E-05	7.3E+00	9E-05
9	Benzo(a)pyrene	1.1E-01	7.8E-04	1	8.3E-05	4.0E-02	2E-03	1.1E-01	6.6E-04	1	7.0E-05	4.0E-02	2E-03	1.1E-01	1.7E-04	1	1.8E-05	7.3E+00	1E-04
10	Benzo(b)fluora	7.5E-02	7.8E-04	1	5.9E-05	4.0E-02	1E-03	7.5E-02	6.6E-04	1	5.0E-05	4.0E-02	1E-03	7.5E-02	1.7E-04	1	1.3E-05	7.3E+00	9E-05
11	Benzo(g,h,i)pe	1.1E-01	7.8E-04	1	8.3E-05	4.0E-02	2E-03	1.1E-01	6.6E-04	1	7.0E-05	4.0E-02	2E-03	1.1E-01	1.7E-04	1	1.8E-05	NA	NA
12	Benzo(k)fluora	9.9E-02	7.8E-04	1	7.7E-05	4.0E-02	2E-03	9.9E-02	6.6E-04	1	6.5E-05	4.0E-02	2E-03	9.9E-02	1.7E-04	1	1.7E-05	7.3E+00	1E-04
13	Beta-endosulfa	2.1E-04	7.8E-04	1	1.7E-07	2.0E-04	8E-04	2.1E-04	6.6E-04	1	1.4E-07	5.0E-05	3E-03	2.1E-04	1.7E-04	1	3.6E-08	NA	NA
14	Boron	1.9E+00	7.8E-04	1	1.5E-03	9.0E-02	2E-02	1.9E+00	6.6E-04	1	1.3E-03	9.0E-02	1E-02	1.9E+00	1.7E-04	1	3.2E-04	NA	NA
15	Cadmium (food	1.1E-02	7.8E-04	1	8.2E-06	NA	NA	1.1E-02	6.6E-04	1	6.9E-06	1.0E-03	7E-03	1.1E-02	1.7E-04	1	1.8E-06	NA	NA
16	Cadmium (wate	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	5.0E-04	NA	NA	1.7E-04	1	NA	NA	NA
17	Chlordane	8.4E-02	7.8E-04	1	6.5E-05	6.0E-05	1E+00	8.4E-02	6.6E-04	1	5.5E-05	6.0E-05	9E-01	8.4E-02	1.7E-04	1	1.4E-05	1.3E+00	2E-05
18	Chromium (VI)	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
19	Chrysene	8.9E-02	7.8E-04	1	7.0E-05	4.0E-02	2E-03	8.9E-02	6.6E-04	1	5.9E-05	4.0E-02	1E-03	8.9E-02	1.7E-04	1	1.5E-05	7.3E+00	1E-04
20	Cyanide (free)	NA	7.8E-04	1	NA	2.0E-02	NA	NA	6.6E-04	1	NA	2.0E-02	NA	NA	1.7E-04	1	NA	NA	NA
21	DDD, 4,4'-	1.2E-02	7.8E-04	1	9.3E-06	NA	NA	1.2E-02	6.6E-04	1	7.9E-06	NA	NA	1.2E-02	1.7E-04	1	2.0E-06	2.4E-01	5E-07
22	DDE, 4,4'-	2.2E-02	7.8E-04	1	1.7E-05	NA	NA	2.2E-02	6.6E-04	1	1.4E-05	NA	NA	2.2E-02	1.7E-04	1	3.7E-06	3.4E-01	1E-06
23	DDT, 4,4'-	8.0E-02	7.8E-04	1	6.2E-05	5.0E-04	1E-01	8.0E-02	6.6E-04	1	5.3E-05	5.0E-04	1E-01	8.0E-02	1.7E-04	1	1.4E-05	3.4E-01	5E-06
24	Dibenz(a,h)ant	3.8E-02	7.8E-04	1	2.9E-05	4.0E-02	7E-04	3.8E-02	6.6E-04	1	2.5E-05	4.0E-02	6E-04	3.8E-02	1.7E-04	1	6.4E-06	7.3E+00	5E-05
25	Dieldrin	1.2E-03	7.8E-04	1	9.0E-07	5.0E-05	2E-02	1.2E-03	6.6E-04	1	7.6E-07	5.0E-05	2E-02	1.2E-03	1.7E-04	1	2.0E-07	1.6E+01	3E-06
26	Dimethylbenzen	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
27	Endrin	1.5E-02	7.8E-04	1	1.2E-05	3.0E-04	4E-02	1.5E-02	6.6E-04	1	1.0E-05	3.0E-04	3E-02	1.5E-02	1.7E-04	1	2.6E-06	NA	NA
28	Fluoranthene	1.0E-01	7.8E-04	1	8.0E-05	4.0E-01	2E-04	1.0E-01	6.6E-04	1	6.7E-05	4.0E-02	2E-03	1.0E-01	1.7E-04	1	1.7E-05	NA	NA
29	Fluorene	0.0E+00	7.8E-04	1	0.0E+00	4.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
30	Gamma-chlordan	2.7E-03	7.8E-04	1	2.1E-06	6.0E-05	3E-02	2.7E-03	6.6E-04	1	1.8E-06	6.0E-05	3E-02	2.7E-03	1.7E-04	1	4.5E-07	1.3E+00	6E-07
31	Gamma-hexachlo	0.0E+00	7.8E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	6.6E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	7.8E-04	1	0.0E+00	5.0E-04	0E+00	0.0E+00	6.6E-04	1	0.0E+00	5.0E-04	0E+00	0.0E+00	1.7E-04	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	4.9E-03	7.8E-04	1	3.8E-06	1.3E-05	3E-01	4.9E-03	6.6E-04	1	3.3E-06	1.3E-05	3E-01	4.9E-03	1.7E-04	1	8.4E-07	9.1E+00	8E-06
34	Indeno(1,2,3-c	4.7E-02	7.8E-04	1	3.6E-05	4.0E-02	9E-04	4.7E-02	6.6E-04	1	3.1E-05	4.0E-02	8E-04	4.7E-02	1.7E-04	1	7.9E-06	7.3E+00	6E-05
35	Lead	1.7E-01	7.8E-04	1	1.3E-04	NA	NA	1.7E-01	6.6E-04	1	1.1E-04	NA	NA	1.7E-01	1.7E-04	1	2.9E-05	NA	NA
36	Mercury, inorg	4.1E-03	7.8E-04	1	3.2E-06	3.0E-04	1E-02	4.1E-03	6.6E-04	1	2.7E-06	3.0E-04	9E-03	4.1E-03	1.7E-04	1	6.9E-07	NA	NA
37	Naphthalene	1.8E-02	7.8E-04	1	1.4E-05	4.0E-02	3E-04	1.8E-02	6.6E-04	1	1.2E-05	4.0E-02	3E-04	1.8E-02	1.7E-04	1	3.0E-06	NA	NA
38	Nickel	8.5E-02	7.8E-04	1	6.7E-05	2.0E-02	3E-03	8.5E-02	6.6E-04	1	5.6E-05	2.0E-02	3E-03	8.5E-02	1.7E-04	1	1.5E-05	NA	NA
39	Nitrate	0.0E+00	7.8E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
40	Nitrite	1.4E+01	7.8E-04	1	1.1E-02	1.0E-01	1E-01	1.4E+01	6.6E-04	1	9.2E-03	1.0E-01	9E-02	1.4E+01	1.7E-04	1	2.4E-03	NA	NA
41	PCB 1260	7.6E-02	7.8E-04	1	5.9E-05	7.0E-05	8E-01	7.6E-02	6.6E-04	1	5.0E-05	7.0E-05	7E-01	7.6E-02	1.7E-04	1	1.3E-05	7.7E+00	1E-04
42	Phenanthrene	2.4E-02	7.8E-04	1	1.9E-05	4.0E-02	5E-04	2.4E-02	6.6E-04	1	1.6E-05	4.0E-02	4E-04	2.4E-02	1.7E-04	1	4.0E-06	NA	NA
43	Pyrene	1.4E-01	7.8E-04	1	1.1E-04	3.0E-01	4E-04	1.4E-01	6.6E-04	1	8.9E-05	3.0E-02	3E-03	1.4E-01	1.7E-04	1	2.3E-05	NA	NA
44	Silver	5.7E-04	7.8E-04	1	4.5E-07	5.0E-03	9E-05	5.7E-04	6.6E-04	1	3.8E-07	5.0E-03	8E-05	5.7E-04	1.7E-04	1	9.8E-08	NA	NA

45	Sulfide	3.2E+01	7.8E-04	1	2.5E-02	NA	NA	3.2E+01	6.6E-04	1	2.1E-02	NA	NA	3.2E+01	1.7E-04	1	5.5E-03	NA	NA
46	Tetrachloroeth	0.0E+00	7.8E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	6.6E-04	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.7E-04	1	0.0E+00	5.2E-02	0E+00
47	Tetrazene	NA	7.8E-04	1	NA	NA	NA	NA	6.6E-04	1	NA	NA	NA	NA	1.7E-04	1	NA	NA	NA
48	Toluene	0.0E+00	7.8E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	7.8E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	0.0E+00	7.8E-04	1	0.0E+00	NA	NA	0.0E+00	6.6E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	7.8E-04	1	0.0E+00	4.0E+00	0E+00	0.0E+00	6.6E-04	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-04	1	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 5

		SUBCHRONIC DAILY INTAKE (mg/kg/day)					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-EXC	ZONE 4-EXC	ZONE 4-EXC	0	0	0
		SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
		ORAL	DERMAL	ORAL	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1.9E-06	NA	1.3E-05	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	3.4E-08	2.7E-09	1.8E-07			
4	Alpha-chlordan	1.3E-07	1.0E-08	1.9E-06			
5	Alpha-endosulf	3.1E-08	2.5E-09	1.8E-07			
6	Anthracene	5.1E-06	NA	4.5E-05			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	3.5E-06	NA	5.4E-05			
9	Benzo(a)pyrene	4.2E-06	NA	8.3E-05			
10	Benzo(b)fluora	3.0E-06	NA	5.9E-05			
11	Benzo(g,h,i)pe	2.5E-06	NA	8.3E-05			
12	Benzo(k)fluora	2.7E-06	NA	7.7E-05			
13	Beta-endosulfa	2.8E-08	2.3E-09	1.7E-07			
14	Boron	4.8E-05	3.8E-07	1.5E-03			
15	Cadmium (food	3.1E-06	2.5E-07	8.2E-06			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	4.5E-06	3.6E-07	6.5E-05			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	4.5E-06	NA	7.0E-05			
20	Cyanide (free)	1.4E-06	3.4E-07	NA			
21	DDD, 4,4'-	5.6E-07	4.4E-08	9.3E-06			
22	DDE, 4,4'-	1.1E-06	8.5E-08	1.7E-05			
23	DDT, 4,4'-	2.8E-06	2.2E-07	6.2E-05			
24	Dibenz(a,h)ant	1.0E-06	NA	2.9E-05			
25	Dieldrin	1.0E-07	8.0E-09	9.0E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.3E-06	1.1E-07	1.2E-05			
28	Fluoranthene	7.3E-06	NA	8.0E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	1.4E-07	1.1E-08	2.1E-06			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00			
33	Heptachlor epo	2.8E-07	2.3E-08	3.8E-06			
34	Indeno(1,2,3-c	1.4E-06	NA	3.6E-05			
35	Lead	7.5E-04	3.6E-05	1.3E-04			
36	Mercury, inorg	8.4E-07	6.7E-09	3.2E-06			
37	Naphthalene	2.5E-06	NA	1.4E-05			
38	Nickel	7.8E-05	NA	6.7E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	2.5E-05	2.0E-07	1.1E-02			
41	PCB 1260	2.0E-06	9.5E-07	5.9E-05			
42	Phenanthrene	2.1E-06	NA	1.9E-05			
43	Pyrene	1.0E-05	NA	1.1E-04			
44	Silver	2.5E-07	2.0E-08	4.5E-07			
45	Sulfide	1.2E-03	9.5E-06	2.5E-02			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	4.6E-06	3.7E-07	NA			

SUBCHRONIC RISK SUMMARY

FUTURE
RESIDENT 5

		SUBCHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-EXC	ZONE 4-EXC	ZONE 4-EXC	0	0	0
		SOIL (0-12'	SOIL (0-12'	VEG (0-12')	0	0	0
		ORAL	DERMAL	ORAL	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	3E-06	NA	2E-05	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	0E+00			
3	Aldrin	1E-03	9E-05	6E-03			
4	Alpha-chlordan	2E-03	2E-04	3E-02			
5	Alpha-endosulf	2E-04	1E-05	9E-04			
6	Anthracene	2E-06	NA	2E-05			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	9E-05	NA	1E-03			
9	Benzo(a)pyrene	1E-04	NA	2E-03			
10	Benzo(b)fluora	7E-05	NA	1E-03			
11	Benzo(g,h,i)pe	6E-05	NA	2E-03			
12	Benzo(k)fluora	7E-05	NA	2E-03			
13	Beta-endosulfa	1E-04	1E-05	8E-04			
14	Boron	5E-04	4E-06	2E-02			
15	Cadmium (food	NA	NA	NA			
16	Cadmium (wate	NA	NA	NA			
17	Chlordane	7E-02	6E-03	1E+00			
18	Chromium (VI)	0E+00	NA	0E+00			
19	Chrysene	1E-04	NA	2E-03			
20	Cyanide (free)	7E-05	2E-05	NA			
21	DDD, 4,4'-	NA	NA	NA			
22	DDE, 4,4'-	NA	NA	NA			
23	DDT, 4,4'-	6E-03	4E-04	1E-01			
24	Dibenz(a,h)ant	3E-05	NA	7E-04			
25	Dieldrin	2E-03	2E-04	2E-02			
26	Dimethylbenzen	0E+00	0E+00	0E+00			
27	Endrin	4E-03	4E-04	4E-02			
28	Fluoranthene	2E-05	NA	2E-04			
29	Fluorene	0E+00	NA	0E+00			
30	Gamma-chlordan	2E-03	2E-04	3E-02			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	0E+00	0E+00	0E+00			
33	Heptachlor epo	2E-02	2E-03	3E-01			
34	Indeno(1,2,3-c	4E-05	NA	9E-04			
35	Lead	NA	NA	NA			
36	Mercury, inorg	3E-03	1E-03	1E-02			
37	Naphthalene	6E-05	NA	3E-04			
38	Nickel	4E-03	NA	3E-03			
39	Nitrate	0E+00	0E+00	0E+00			
40	Nitrite	3E-04	2E-06	1E-01			
41	PCB 1260	3E-02	1E-02	8E-01			
42	Phenanthrene	5E-05	NA	5E-04			
43	Pyrene	3E-05	NA	4E-04			
44	Silver	5E-05	8E-05	9E-05			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA		
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00		
				PATHWAY SUM (HI)	1E-01	2E-02	2E+00	0E+00	0E+00	0E+00
				POPULATION TOTAL	2E+00					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
RESIDENT 5

CHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 4-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 4-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 4-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	1.3E-06	NA	1.1E-05	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	2.3E-08	2.6E-09	1.6E-07			
4	Alpha-chlordan	8.7E-08	9.9E-09	1.6E-06			
5	Alpha-endosulf	2.0E-08	2.3E-09	1.5E-07			
6	Anthracene	3.4E-06	NA	3.8E-05			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	2.3E-06	NA	4.6E-05			
9	Benzo(a)pyrene	2.8E-06	NA	7.0E-05			
10	Benzo(b)fluora	2.0E-06	NA	5.0E-05			
11	Benzo(g,h,i)pe	1.7E-06	NA	7.0E-05			
12	Benzo(k)fluora	1.8E-06	NA	6.5E-05			
13	Beta-endosulfa	1.9E-08	2.1E-09	1.4E-07			
14	Boron	3.2E-05	3.6E-07	1.3E-03			
15	Cadmium (food	2.1E-06	2.3E-07	6.9E-06			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	3.0E-06	3.4E-07	5.5E-05			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	3.0E-06	NA	5.9E-05			
20	Cyanide (free)	9.6E-07	3.3E-07	NA			
21	DDD, 4,4'-	3.7E-07	4.2E-08	7.9E-06			
22	DDE, 4,4'-	7.1E-07	8.0E-08	1.4E-05			
23	DDT, 4,4'-	1.9E-06	2.1E-07	5.3E-05			
24	Dibenz(a,h)ant	6.8E-07	NA	2.5E-05			
25	Dieldrin	6.7E-08	7.6E-09	7.6E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	9.0E-07	1.0E-07	1.0E-05			
28	Fluoranthene	4.9E-06	NA	6.7E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	9.5E-08	1.1E-08	1.8E-06			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00			
33	Heptachlor epo	1.9E-07	2.1E-08	3.3E-06			
34	Indeno(1,2,3-c	9.7E-07	NA	3.1E-05			
35	Lead	5.0E-04	3.4E-05	1.1E-04			
36	Mercury, inorg	5.6E-07	6.4E-09	2.7E-06			
37	Naphthalene	1.7E-06	NA	1.2E-05			
38	Nickel	5.2E-05	NA	5.6E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	1.7E-05	1.9E-07	9.2E-03			
41	PCB 1260	1.3E-06	9.0E-07	5.0E-05			
42	Phenanthrene	1.4E-06	NA	1.6E-05			
43	Pyrene	6.7E-06	NA	8.9E-05			
44	Silver	1.7E-07	1.9E-08	3.8E-07			
45	Sulfide	7.9E-04	9.0E-06	2.1E-02			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	3.0E-06	3.5E-07	NA			

CHRONIC RISK SUMMARY

FUTURE
RESIDENT 5

CHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 ZONE 4-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 4-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 4-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	2E-05	NA	2E-04	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	0E+00			
3	Aldrin	8E-04	9E-05	5E-03			
4	Alpha-chlordan	1E-03	2E-04	3E-02			
5	Alpha-endosulf	4E-04	5E-05	3E-03			
6	Anthracene	1E-05	NA	1E-04			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	6E-05	NA	1E-03			
9	Benzo(a)pyrene	7E-05	NA	2E-03			
10	Benzo(b)fluora	5E-05	NA	1E-03			
11	Benzo(g,h,i)pe	4E-05	NA	2E-03			
12	Benzo(k)fluora	4E-05	NA	2E-03			
13	Beta-endosulfa	4E-04	4E-05	3E-03			
14	Boron	4E-04	4E-06	1E-02			
15	Cadmium (food	2E-03	9E-03	7E-03			
16	Cadmium (wate	0E+00	NA	NA			
17	Chlordane	5E-02	6E-03	9E-01			
18	Chromium (VI)	0E+00	NA	0E+00			
19	Chrysene	7E-05	NA	1E-03			
20	Cyanide (free)	5E-05	2E-05	NA			
21	DDD, 4,4'-	NA	NA	NA			
22	DDE, 4,4'-	NA	NA	NA			
23	DDT, 4,4'-	4E-03	4E-04	1E-01			
24	Dibenz(a,h)ant	2E-05	NA	6E-04			
25	Dieldrin	1E-03	2E-04	2E-02			
26	Dimethylbenzen	0E+00	0E+00	0E+00			
27	Endrin	3E-03	3E-04	3E-02			
28	Fluoranthene	1E-04	NA	2E-03			
29	Fluorene	0E+00	NA	0E+00			
30	Gamma-chlordan	2E-03	2E-04	3E-02			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	0E+00	0E+00	0E+00			
33	Heptachlor epo	1E-02	2E-03	3E-01			
34	Indeno(1,2,3-c	2E-05	NA	8E-04			
35	Lead	NA	NA	NA			
36	Mercury, inorg	2E-03	1E-03	9E-03			
37	Naphthalene	4E-05	NA	3E-04			
38	Nickel	3E-03	NA	3E-03			
39	Nitrate	0E+00	0E+00	0E+00			
40	Nitrite	2E-04	2E-06	9E-02			
41	PCB 1260	2E-02	1E-02	7E-01			
42	Phenanthrene	3E-05	NA	4E-04			
43	Pyrene	2E-04	NA	3E-03			
44	Silver	3E-05	7E-05	8E-05			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00			
				PATHWAY SUM (HI)	1E-01	3E-02	2E+00	0E+00	0E+00	0E+00
				POPULATION TOTAL	2E+00					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP5
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
RESIDENT 5

LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 ZONE 4-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 4-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 4-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	1.8E-07	NA	2.8E-06	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA	0.0E+00			
3	Aldrin	3.2E-09	6.7E-10	4.0E-08			
4	Alpha-chlordan	1.2E-08	2.6E-09	4.2E-07			
5	Alpha-endosulf	2.9E-09	6.0E-10	3.9E-08			
6	Anthracene	4.7E-07	NA	9.9E-06			
7	Benzene	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	3.3E-07	NA	1.2E-05			
9	Benzo(a)pyrene	3.9E-07	NA	1.8E-05			
10	Benzo(b)fluora	2.8E-07	NA	1.3E-05			
11	Benzo(g,h,i)pe	2.4E-07	NA	1.8E-05			
12	Benzo(k)fluora	2.5E-07	NA	1.7E-05			
13	Beta-endosulfa	2.6E-09	5.5E-10	3.6E-08			
14	Boron	4.5E-06	9.3E-08	3.2E-04			
15	Cadmium (food	2.9E-07	6.1E-08	1.8E-06			
16	Cadmium (wate	0.0E+00	NA	NA			
17	Chlordane	4.2E-07	8.7E-08	1.4E-05			
18	Chromium (VI)	0.0E+00	NA	0.0E+00			
19	Chrysene	4.2E-07	NA	1.5E-05			
20	Cyanide (free)	1.3E-07	8.4E-08	NA			
21	DDD, 4,4'-	5.2E-08	1.1E-08	2.0E-06			
22	DDE, 4,4'-	9.9E-08	2.1E-08	3.7E-06			
23	DDT, 4,4'-	2.6E-07	5.5E-08	1.4E-05			
24	Dibenz(a,h)ant	9.5E-08	NA	6.4E-06			
25	Dieldrin	9.4E-09	2.0E-09	2.0E-07			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00			
27	Endrin	1.3E-07	2.6E-08	2.6E-06			
28	Fluoranthene	6.8E-07	NA	1.7E-05			
29	Fluorene	0.0E+00	NA	0.0E+00			
30	Gamma-chlordan	1.3E-08	2.8E-09	4.5E-07			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00			
33	Heptachlor epo	2.6E-08	5.5E-09	8.4E-07			
34	Indeno(1,2,3-c	1.4E-07	NA	7.9E-06			
35	Lead	7.0E-05	8.8E-06	2.9E-05			
36	Mercury, inorg	7.9E-08	1.6E-09	6.9E-07			
37	Naphthalene	2.3E-07	NA	3.0E-06			
38	Nickel	7.3E-06	NA	1.5E-05			
39	Nitrate	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	2.4E-06	5.0E-08	2.4E-03			
41	PCB 1260	1.8E-07	2.3E-07	1.3E-05			
42	Phenanthrene	1.9E-07	NA	4.0E-06			
43	Pyrene	9.4E-07	NA	2.3E-05			
44	Silver	2.3E-08	4.8E-09	9.8E-08			
45	Sulfide	1.1E-04	2.3E-06	5.5E-03			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	4.3E-07	8.9E-08	NA			

LIFETIME RISK SUMMARY

FUTURE
RESIDENT 5

LIFETIME EXCESS CANCER RISK

	CHEMICAL NAME	SCENARIO 1 ZONE 4-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 4-EXC SOIL (0-12' DERMAL (FROM WS2)	SCENARIO 3 ZONE 4-EXC VEG (0-12') ORAL (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	NA	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA	NA			
3	Aldrin	5E-08	1E-08	7E-07			
4	Alpha-chlordan	2E-08	4E-09	5E-07			
5	Alpha-endosulf	NA	NA	NA			
6	Anthracene	NA	NA	NA			
7	Benzene	0E+00	0E+00	0E+00			
8	Benzo(a)anthra	2E-06	NA	9E-05			
9	Benzo(a)pyrene	3E-06	NA	1E-04			
10	Benzo(b)fluora	2E-06	NA	9E-05			
11	Benzo(g,h,i)pe	NA	NA	NA			
12	Benzo(k)fluora	2E-06	NA	1E-04			
13	Beta-endosulfa	NA	NA	NA			
14	Boron	NA	NA	NA			
15	Cadmium (food	NA	NA	NA			
16	Cadmium (wate	NA	NA	NA			
17	Chlordane	5E-07	1E-07	2E-05			
18	Chromium (VI)	NA	NA	NA			
19	Chrysene	3E-06	NA	1E-04			
20	Cyanide (free)	NA	NA	NA			
21	DDD, 4,4'-	1E-08	3E-09	5E-07			
22	DDE, 4,4'-	3E-08	7E-09	1E-06			
23	DDT, 4,4'-	9E-08	2E-08	5E-06			
24	Dibenz(a,h)ant	7E-07	NA	5E-05			
25	Dieldrin	1E-07	3E-08	3E-06			
26	Dimethylbenzen	NA	NA	NA			
27	Endrin	NA	NA	NA			
28	Fluoranthene	NA	NA	NA			
29	Fluorene	NA	NA	NA			
30	Gamma-chlordan	2E-08	5E-09	6E-07			
31	Gamma-hexachlo	0E+00	0E+00	0E+00			
32	Heptachlor	0E+00	0E+00	0E+00			
33	Heptachlor epo	2E-07	5E-08	8E-06			
34	Indeno(1,2,3-c	1E-06	NA	6E-05			
35	Lead	NA	NA	NA			
36	Mercury, inorg	NA	NA	NA			
37	Naphthalene	NA	NA	NA			
38	Nickel	NA	NA	NA			
39	Nitrate	NA	NA	NA			
40	Nitrite	NA	NA	NA			
41	PCB 1260	1E-06	2E-06	1E-04			
42	Phenanthrene	NA	NA	NA			
43	Pyrene	NA	NA	NA			
44	Silver	NA	NA	NA			
45	Sulfide	NA	NA	NA			
46	Tetrachloroeth	0E+00	0E+00	0E+00			
47	Tetrazene	NA	NA	NA			

48 Toluene	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
49 Trichloroethen	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA			
TOTAL PATHWAY CANCER RISK				2E-05	2E-06	7E-04	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK				7E-04					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: CONST. WORKER 1

EXPOSURE POINT: ZONE 1-EXC
MEDIUM: SOIL (0-12')
ROUTE: ORAL

HIFs = 3.4E-07
HIFc = 0.0E+00
HIFl = 4.8E-09

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP6
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	3.4E-07	1	0.0E+00	6.0E-01	0E+00		0.0E+00		0.0E+00		ERR	0.0E+00	4.8E-09	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	3.4E-07	1	0.0E+00	3.0E-05	0E+00							0.0E+00	4.8E-09	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.3E-01	3.4E-07	1	4.5E-08	6.0E-05	7E-04							1.3E-01	4.8E-09	1	6.3E-10	1.3E+00	8E-10
5	Alpha-endosulf	0.0E+00	3.4E-07	1	0.0E+00	2.0E-04	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	3.4E-07	1	0.0E+00	3.0E+00	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	3.4E-07	1	0.0E+00	5.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.2E-01	3.4E-07	1	1.1E-07	4.0E-02	3E-06							3.2E-01	4.8E-09	1	1.5E-09	7.3E+00	1E-08
9	Benzo(a)pyrene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	3.9E-01	3.4E-07	1	1.3E-07	4.0E-02	3E-06							3.9E-01	4.8E-09	1	1.9E-09	7.3E+00	1E-08
11	Benzo(g,h,i)pe	3.6E-01	3.4E-07	1	1.2E-07	4.0E-02	3E-06							3.6E-01	4.8E-09	1	1.7E-09	NA	NA
12	Benzo(k)fluora	3.3E-01	3.4E-07	1	1.1E-07	4.0E-02	3E-06							3.3E-01	4.8E-09	1	1.6E-09	7.3E+00	1E-08
13	Beta-endosulfa	3.3E-03	3.4E-07	1	1.1E-09	2.0E-04	6E-06							3.3E-03	4.8E-09	1	1.6E-11	NA	NA
14	Boron	--	3.4E-07	1	0.0E+00	9.0E-02	0E+00							--	4.8E-09	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	3.4E-07	1	0.0E+00	NA	NA							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
16	Cadmium (wate	--	3.4E-07	1	0.0E+00	NA	NA							--	4.8E-09	1	0.0E+00	NA	NA
17	Chlordane	1.3E-01	3.4E-07	1	4.5E-08	6.0E-05	7E-04							1.3E-01	4.8E-09	1	6.3E-10	1.3E+00	8E-10
18	Chromium (VI)	0.0E+00	3.4E-07	1	0.0E+00	2.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
19	Chrysene	2.4E-01	3.4E-07	1	8.0E-08	4.0E-02	2E-06							2.4E-01	4.8E-09	1	1.1E-09	7.3E+00	8E-09
20	Cyanide (free)	0.0E+00	3.4E-07	1	0.0E+00	2.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
21	DDD, 4,4'-	2.0E-02	3.4E-07	1	6.8E-09	NA	NA							2.0E-02	4.8E-09	1	9.6E-11	2.4E-01	2E-11
22	DDE, 4,4'-	6.2E-02	3.4E-07	1	2.1E-08	NA	NA							6.2E-02	4.8E-09	1	3.0E-10	3.4E-01	1E-10
23	DDT, 4,4'-	6.5E-02	3.4E-07	1	2.2E-08	5.0E-04	4E-05							6.5E-02	4.8E-09	1	3.1E-10	3.4E-01	1E-10
24	Dibenz(a,h)ant	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	2.7E-02	3.4E-07	1	9.1E-09	5.0E-05	2E-04							2.7E-02	4.8E-09	1	1.3E-10	1.6E+01	2E-09
26	Dimethylbenzen	0.0E+00	3.4E-07	1	0.0E+00	4.0E+00	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
27	Endrin	3.5E-02	3.4E-07	1	1.2E-08	3.0E-04	4E-05							3.5E-02	4.8E-09	1	1.7E-10	NA	NA
28	Fluoranthene	6.3E-01	3.4E-07	1	2.1E-07	4.0E-01	5E-07							6.3E-01	4.8E-09	1	3.0E-09	NA	NA
29	Fluorene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-01	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	3.4E-07	1	0.0E+00	6.0E-05	0E+00							0.0E+00	4.8E-09	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	3.4E-07	1	0.0E+00	3.0E-03	0E+00							0.0E+00	4.8E-09	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	3.1E-03	3.4E-07	1	1.1E-09	5.0E-04	2E-06							3.1E-03	4.8E-09	1	1.5E-11	4.5E+00	7E-11
33	Heptachlor epo	1.7E-02	3.4E-07	1	5.8E-09	1.3E-05	4E-04							1.7E-02	4.8E-09	1	8.2E-11	9.1E+00	7E-10
34	Indeno(1,2,3-c	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	7.3E+00	0E+00
35	Lead	6.4E+01	3.4E-07	1	2.2E-05	NA	NA							6.4E+01	4.8E-09	1	3.1E-07	NA	NA
36	Mercury, inorg	9.6E-02	3.4E-07	1	3.3E-08	3.0E-04	1E-04							9.6E-02	4.8E-09	1	4.6E-10	NA	NA
37	Naphthalene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
38	Nickel	2.4E+01	3.4E-07	1	8.0E-06	2.0E-02	4E-04							2.4E+01	4.8E-09	1	1.1E-07	NA	NA
39	Nitrate	--	3.4E-07	1	0.0E+00	1.6E+00	0E+00							--	4.8E-09	1	0.0E+00	NA	NA
40	Nitrite	--	3.4E-07	1	0.0E+00	1.0E-01	0E+00							--	4.8E-09	1	0.0E+00	NA	NA
41	PCB 1260	1.2E-01	3.4E-07	1	4.0E-08	7.0E-05	6E-04							1.2E-01	4.8E-09	1	5.6E-10	7.7E+00	4E-09
42	Phenanthrene	4.5E-01	3.4E-07	1	1.5E-07	4.0E-02	4E-06							4.5E-01	4.8E-09	1	2.2E-09	NA	NA
43	Pyrene	7.5E-01	3.4E-07	1	2.5E-07	3.0E-01	8E-07							7.5E-01	4.8E-09	1	3.6E-09	NA	NA
44	Silver	4.5E-02	3.4E-07	1	1.5E-08	5.0E-03	3E-06							4.5E-02	4.8E-09	1	2.2E-10	NA	NA

45 Sulfide	--	3.4E-07	1	0.0E+00	NA	NA	--	4.8E-09	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	3.4E-07	1	0.0E+00	1.0E-01	0E+00	0.0E+00	4.8E-09	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	3.4E-07	1	0.0E+00	NA	NA	--	4.8E-09	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	3.4E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.8E-09	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	3.4E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.8E-09	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	0.0E+00	3.4E-07	1	0.0E+00	NA	NA	0.0E+00	4.8E-09	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	3.4E-07	1	0.0E+00	4.0E+00	0E+00	0.0E+00	4.8E-09	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP6
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: CONST. WORKER 1

EXPOSURE POINT: ZONE 1-EXC
MEDIUM: DUST (PM10)
ROUTE: INHALATION

HIFs = 1.4E-02
HIFc = 0.0E+00
HIFl = 2.0E-04

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA		0.0E+00		0.0E+00		ERR	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	6.6E-07	1.4E-02	1	9.2E-09	NA	NA							6.6E-07	2.0E-04	1	1.3E-10	1.3E+00	2E-10
5	Alpha-endosulf	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	1.4E-02	1	0.0E+00	9.1E-03	0E+00							0.0E+00	2.0E-04	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	1.6E-06	1.4E-02	1	2.2E-08	NA	NA							1.6E-06	2.0E-04	1	3.2E-10	NA	NA
9	Benzo(a)pyrene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
10	Benzo(b)fluora	1.9E-06	1.4E-02	1	2.7E-08	NA	NA							1.9E-06	2.0E-04	1	3.9E-10	NA	NA
11	Benzo(g,h,i)pe	1.8E-06	1.4E-02	1	2.5E-08	NA	NA							1.8E-06	2.0E-04	1	3.6E-10	NA	NA
12	Benzo(k)fluora	1.7E-06	1.4E-02	1	2.3E-08	NA	NA							1.7E-06	2.0E-04	1	3.3E-10	NA	NA
13	Beta-endosulfa	1.7E-08	1.4E-02	1	2.3E-10	NA	NA							1.7E-08	2.0E-04	1	3.3E-12	NA	NA
14	Boron	0.0E+00	1.4E-02	1	0.0E+00	5.7E-03	0E+00							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	6.1E+00	0E+00
16	Cadmium (wate	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
17	Chlordane	6.6E-07	1.4E-02	1	9.2E-09	NA	NA							6.6E-07	2.0E-04	1	1.3E-10	1.3E+00	2E-10
18	Chromium (VI)	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	4.2E+01	0E+00
19	Chrysene	1.2E-06	1.4E-02	1	1.7E-08	NA	NA							1.2E-06	2.0E-04	1	2.4E-10	NA	NA
20	Cyanide (free)	0.0E+00	1.4E-02	1	0.0E+00	2.9E-04	0E+00							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
21	DDD, 4,4'-	1.0E-07	1.4E-02	1	1.4E-09	NA	NA							1.0E-07	2.0E-04	1	2.0E-11	NA	NA
22	DDE, 4,4'-	3.1E-07	1.4E-02	1	4.4E-09	NA	NA							3.1E-07	2.0E-04	1	6.2E-11	NA	NA
23	DDT, 4,4'-	3.2E-07	1.4E-02	1	4.5E-09	NA	NA							3.2E-07	2.0E-04	1	6.5E-11	3.4E-01	2E-11
24	Dibenz(a,h)ant	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
25	Dieldrin	1.3E-07	1.4E-02	1	1.9E-09	NA	NA							1.3E-07	2.0E-04	1	2.7E-11	1.6E+01	4E-10
26	Dimethylbenzen	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
27	Endrin	1.8E-07	1.4E-02	1	2.5E-09	NA	NA							1.8E-07	2.0E-04	1	3.5E-11	NA	NA
28	Fluoranthene	3.2E-06	1.4E-02	1	4.4E-08	NA	NA							3.2E-06	2.0E-04	1	6.3E-10	NA	NA
29	Fluorene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
30	Gamma-chlordan	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
32	Heptachlor	1.5E-08	1.4E-02	1	2.2E-10	NA	NA							1.5E-08	2.0E-04	1	3.1E-12	4.5E+00	1E-11
33	Heptachlor epo	8.6E-08	1.4E-02	1	1.2E-09	NA	NA							8.6E-08	2.0E-04	1	1.7E-11	9.1E+00	2E-10
34	Indeno(1,2,3-c	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
35	Lead	3.2E-04	1.4E-02	1	4.5E-06	NA	NA							3.2E-04	2.0E-04	1	6.4E-08	NA	NA
36	Mercury, inorg	4.8E-07	1.4E-02	1	6.7E-09	NA	NA							4.8E-07	2.0E-04	1	9.6E-11	NA	NA
37	Naphthalene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
38	Nickel	1.2E-04	1.4E-02	1	1.6E-06	NA	NA							1.2E-04	2.0E-04	1	2.4E-08	8.4E-01	2E-08
39	Nitrate	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
40	Nitrite	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
41	PCB 1260	5.9E-07	1.4E-02	1	8.2E-09	NA	NA							5.9E-07	2.0E-04	1	1.2E-10	NA	NA
42	Phenanthrene	2.3E-06	1.4E-02	1	3.2E-08	NA	NA							2.3E-06	2.0E-04	1	4.5E-10	NA	NA
43	Pyrene	3.7E-06	1.4E-02	1	5.2E-08	NA	NA							3.7E-06	2.0E-04	1	7.5E-10	NA	NA
44	Silver	2.3E-07	1.4E-02	1	3.2E-09	NA	NA							2.3E-07	2.0E-04	1	4.5E-11	NA	NA

45	Sulfide	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
46	Tetrachloroeth	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	2.0E-03	0E+00
47	Tetrazene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
48	Toluene	0.0E+00	1.4E-02	1	0.0E+00	5.7E-01	0E+00	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	6.0E-03	0E+00
50	Uranium (solub	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP6
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
CONST. WORKER 1

		SUBCHRONIC DAILY INTAKE (mg/kg/day)					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 1-EXC	ZONE 1-EXC	0	0	0	0
		SOIL (0-12'	DUST (PM10)	0	0	0	0
		ORAL	INHALATION	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00				
3	Aldrin	0.0E+00	0.0E+00				
4	Alpha-chlordan	4.5E-08	9.2E-09				
5	Alpha-endosulf	0.0E+00	0.0E+00				
6	Anthracene	0.0E+00	0.0E+00				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	1.1E-07	2.2E-08				
9	Benzo(a)pyrene	0.0E+00	0.0E+00				
10	Benzo(b)fluora	1.3E-07	2.7E-08				
11	Benzo(g,h,i)pe	1.2E-07	2.5E-08				
12	Benzo(k)fluora	1.1E-07	2.3E-08				
13	Beta-endosulfa	1.1E-09	2.3E-10				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	0.0E+00	0.0E+00				
16	Cadmium (wate	0.0E+00	0.0E+00				
17	Chlordane	4.5E-08	9.2E-09				
18	Chromium (VI)	0.0E+00	0.0E+00				
19	Chrysene	8.0E-08	1.7E-08				
20	Cyanide (free)	0.0E+00	0.0E+00				
21	DDD, 4,4'-	6.8E-09	1.4E-09				
22	DDE, 4,4'-	2.1E-08	4.4E-09				
23	DDT, 4,4'-	2.2E-08	4.5E-09				
24	Dibenz(a,h)ant	0.0E+00	0.0E+00				
25	Dieldrin	9.1E-09	1.9E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	1.2E-08	2.5E-09				
28	Fluoranthene	2.1E-07	4.4E-08				
29	Fluorene	0.0E+00	0.0E+00				
30	Gamma-chlordan	0.0E+00	0.0E+00				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	1.1E-09	2.2E-10				
33	Heptachlor epo	5.8E-09	1.2E-09				
34	Indeno(1,2,3-c	0.0E+00	0.0E+00				
35	Lead	2.2E-05	4.5E-06				
36	Mercury, inorg	3.3E-08	6.7E-09				
37	Naphthalene	0.0E+00	0.0E+00				
38	Nickel	8.0E-06	1.6E-06				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	4.0E-08	8.2E-09				
42	Phenanthrene	1.5E-07	3.2E-08				
43	Pyrene	2.5E-07	5.2E-08				
44	Silver	1.5E-08	3.2E-09				
45	Sulfide	0.0E+00	0.0E+00				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

SUBCHRONIC RISK SUMMARY

FUTURE
CONST. WORKER 1

		SUBCHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 1-EXC	ZONE 1-EXC	0	0	0	0
		SOIL (0-12'	DUST (PM10)	0	0	0	0
		ORAL	INHALATION	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0E+00	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	0E+00	NA				
4	Alpha-chlordan	7E-04	NA				
5	Alpha-endosulf	0E+00	NA				
6	Anthracene	0E+00	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	3E-06	NA				
9	Benzo(a)pyrene	0E+00	NA				
10	Benzo(b)fluora	3E-06	NA				
11	Benzo(g,h,i)pe	3E-06	NA				
12	Benzo(k)fluora	3E-06	NA				
13	Beta-endosulfa	6E-06	NA				
14	Boron	0E+00	0E+00				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	7E-04	NA				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	2E-06	NA				
20	Cyanide (free)	0E+00	0E+00				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	4E-05	NA				
24	Dibenz(a,h)ant	0E+00	NA				
25	Dieldrin	2E-04	NA				
26	Dimethylbenzen	0E+00	NA				
27	Endrin	4E-05	NA				
28	Fluoranthene	5E-07	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	0E+00	NA				
31	Gamma-hexachlo	0E+00	NA				
32	Heptachlor	2E-06	NA				
33	Heptachlor epo	4E-04	NA				
34	Indeno(1,2,3-c	0E+00	NA				
35	Lead	NA	NA				
36	Mercury, inorg	1E-04	NA				
37	Naphthalene	0E+00	NA				
38	Nickel	4E-04	NA				
39	Nitrate	0E+00	NA				
40	Nitrite	0E+00	NA				
41	PCB 1260	6E-04	NA				
42	Phenanthrene	4E-06	NA				
43	Pyrene	8E-07	NA				
44	Silver	3E-06	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	NA				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	NA				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	0E+00	NA				
PATHWAY SUM (HI)			3E-03	0E+00	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL			3E-03					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP6
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
CONST. WORKER 1

	CHEMICAL NAME	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day) SCENARIO 1 ZONE 1-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 1-EXC DUST (PM10) INHALATION (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00				
3	Aldrin	0.0E+00	0.0E+00				
4	Alpha-chlordan	6.3E-10	1.3E-10				
5	Alpha-endosulf	0.0E+00	0.0E+00				
6	Anthracene	0.0E+00	0.0E+00				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	1.5E-09	3.2E-10				
9	Benzo(a)pyrene	0.0E+00	0.0E+00				
10	Benzo(b)fluora	1.9E-09	3.9E-10				
11	Benzo(g,h,i)pe	1.7E-09	3.6E-10				
12	Benzo(k)fluora	1.6E-09	3.3E-10				
13	Beta-endosulfa	1.6E-11	3.3E-12				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	0.0E+00	0.0E+00				
16	Cadmium (wate	0.0E+00	0.0E+00				
17	Chlordane	6.3E-10	1.3E-10				
18	Chromium (VI)	0.0E+00	0.0E+00				
19	Chrysene	1.1E-09	2.4E-10				
20	Cyanide (free)	0.0E+00	0.0E+00				
21	DDD, 4,4'-	9.6E-11	2.0E-11				
22	DDE, 4,4'-	3.0E-10	6.2E-11				
23	DDT, 4,4'-	3.1E-10	6.5E-11				
24	Dibenz(a,h)ant	0.0E+00	0.0E+00				
25	Dieldrin	1.3E-10	2.7E-11				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	1.7E-10	3.5E-11				
28	Fluoranthene	3.0E-09	6.3E-10				
29	Fluorene	0.0E+00	0.0E+00				
30	Gamma-chlordan	0.0E+00	0.0E+00				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	1.5E-11	3.1E-12				
33	Heptachlor epo	8.2E-11	1.7E-11				
34	Indeno(1,2,3-c	0.0E+00	0.0E+00				
35	Lead	3.1E-07	6.4E-08				
36	Mercury, inorg	4.6E-10	9.6E-11				
37	Naphthalene	0.0E+00	0.0E+00				
38	Nickel	1.1E-07	2.4E-08				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	5.6E-10	1.2E-10				
42	Phenanthrene	2.2E-09	4.5E-10				
43	Pyrene	3.6E-09	7.5E-10				
44	Silver	2.2E-10	4.5E-11				
45	Sulfide	0.0E+00	0.0E+00				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

LIFETIME RISK SUMMARY

FUTURE
CONST. WORKER 1

	CHEMICAL NAME	LIFETIME EXCESS CANCER RISK SCENARIO 1 ZONE 1-EXC SOIL (0-12' ORAL (FROM WS1)	SCENARIO 2 ZONE 1-EXC DUST (PM10) INHALATION (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	0E+00	0E+00				
4	Alpha-chlordan	8E-10	2E-10				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	1E-08	NA				
9	Benzo(a)pyrene	0E+00	NA				
10	Benzo(b)fluora	1E-08	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	1E-08	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	0E+00				
16	Cadmium (wate	NA	NA				
17	Chlordane	8E-10	2E-10				
18	Chromium (VI)	NA	0E+00				
19	Chrysene	8E-09	NA				
20	Cyanide (free)	NA.	NA				
21	DDD, 4,4'-	2E-11	NA				
22	DDE, 4,4'-	1E-10	NA				
23	DDT, 4,4'-	1E-10	2E-11				
24	Dibenz(a,h)ant	0E+00	NA				
25	Dieldrin	2E-09	4E-10				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	0E+00	0E+00				
31	Gamma-hexachlo	0E+00	NA				
32	Heptachlor	7E-11	1E-11				
33	Heptachlor epo	7E-10	2E-10				
34	Indeno(1,2,3-c	0E+00	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	2E-08				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	4E-09	NA				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			5E-08	2E-08	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			7E-08					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP7
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: CONST. WORKER 2

EXPOSURE POINT: ZONE 4-EXC
MEDIUM: SOIL (0-12')
ROUTE: ORAL

HIFs = 3.4E-07
HIFc = 0.0E+00
HIFl = 4.8E-09

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	4.3E-01	3.4E-07	1	1.5E-07	6.0E-01	2E-07		0.0E+00		0.0E+00		ERR	4.3E-01	4.8E-09	1	2.1E-09	NA	NA
2	Acenaphthylene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
3	Aldrin	7.6E-03	3.4E-07	1	2.6E-09	3.0E-05	9E-05							7.6E-03	4.8E-09	1	3.7E-11	1.7E+01	6E-10
4	Alpha-chlordan	2.9E-02	3.4E-07	1	9.9E-09	6.0E-05	2E-04							2.9E-02	4.8E-09	1	1.4E-10	1.3E+00	2E-10
5	Alpha-endosulf	6.8E-03	3.4E-07	1	2.3E-09	2.0E-04	1E-05							6.8E-03	4.8E-09	1	3.3E-11	NA	NA
6	Anthracene	1.1E+00	3.4E-07	1	3.8E-07	3.0E+00	1E-07							1.1E+00	4.8E-09	1	5.4E-09	NA	NA
7	Benzene	0.0E+00	3.4E-07	1	0.0E+00	5.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	7.8E-01	3.4E-07	1	2.6E-07	4.0E-02	7E-06							7.8E-01	4.8E-09	1	3.7E-09	7.3E+00	3E-08
9	Benzo(a)pyrene	9.4E-01	3.4E-07	1	3.2E-07	4.0E-02	8E-06							9.4E-01	4.8E-09	1	4.5E-09	7.3E+00	3E-08
10	Benzo(b)fluora	6.6E-01	3.4E-07	1	2.2E-07	4.0E-02	6E-06							6.6E-01	4.8E-09	1	3.2E-09	7.3E+00	2E-08
11	Benzo(g,h,i)pe	5.6E-01	3.4E-07	1	1.9E-07	4.0E-02	5E-06							5.6E-01	4.8E-09	1	2.7E-09	NA	NA
12	Benzo(k)fluora	5.9E-01	3.4E-07	1	2.0E-07	4.0E-02	5E-06							5.9E-01	4.8E-09	1	2.8E-09	7.3E+00	2E-08
13	Beta-endosulfa	6.3E-03	3.4E-07	1	2.1E-09	2.0E-04	1E-05							6.3E-03	4.8E-09	1	3.0E-11	NA	NA
14	Boron	1.1E+01	3.4E-07	1	3.6E-06	9.0E-02	4E-05							1.1E+01	4.8E-09	1	5.1E-08	NA	NA
15	Cadmium (food	6.9E-01	3.4E-07	1	2.3E-07	NA	NA							6.9E-01	4.8E-09	1	3.3E-09	NA	NA
16	Cadmium (wate	--	3.4E-07	1	0.0E+00	NA	NA							--	4.8E-09	1	0.0E+00	NA	NA
17	Chlordane	9.9E-01	3.4E-07	1	3.4E-07	6.0E-05	6E-03							9.9E-01	4.8E-09	1	4.8E-09	1.3E+00	6E-09
18	Chromium (VI)	0.0E+00	3.4E-07	1	0.0E+00	2.0E-02	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
19	Chrysene	9.9E-01	3.4E-07	1	3.4E-07	4.0E-02	8E-06							9.9E-01	4.8E-09	1	4.8E-09	7.3E+00	3E-08
20	Cyanide (free)	3.2E-01	3.4E-07	1	1.1E-07	2.0E-02	5E-06							3.2E-01	4.8E-09	1	1.5E-09	NA	NA
21	DDD, 4,4'-	1.2E-01	3.4E-07	1	4.2E-08	NA	NA							1.2E-01	4.8E-09	1	5.9E-10	2.4E-01	1E-10
22	DDE, 4,4'-	2.4E-01	3.4E-07	1	8.0E-08	NA	NA							2.4E-01	4.8E-09	1	1.1E-09	3.4E-01	4E-10
23	DDT, 4,4'-	6.2E-01	3.4E-07	1	2.1E-07	5.0E-04	4E-04							6.2E-01	4.8E-09	1	3.0E-09	3.4E-01	1E-09
24	Dibenz(a,h)ant	2.3E-01	3.4E-07	1	7.7E-08	4.0E-02	2E-06							2.3E-01	4.8E-09	1	1.1E-09	7.3E+00	8E-09
25	Dieldrin	2.2E-02	3.4E-07	1	7.6E-09	5.0E-05	2E-04							2.2E-02	4.8E-09	1	1.1E-10	1.6E+01	2E-09
26	Dimethylbenzen	0.0E+00	3.4E-07	1	0.0E+00	4.0E+00	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
27	Endrin	3.0E-01	3.4E-07	1	1.0E-07	3.0E-04	3E-04							3.0E-01	4.8E-09	1	1.4E-09	NA	NA
28	Fluoranthene	1.6E+00	3.4E-07	1	5.5E-07	4.0E-01	1E-06							1.6E+00	4.8E-09	1	7.8E-09	NA	NA
29	Fluorene	0.0E+00	3.4E-07	1	0.0E+00	4.0E-01	0E+00							0.0E+00	4.8E-09	1	0.0E+00	NA	NA
30	Gamma-chlordan	3.2E-02	3.4E-07	1	1.1E-08	6.0E-05	2E-04							3.2E-02	4.8E-09	1	1.5E-10	1.3E+00	2E-10
31	Gamma-hexachlo	0.0E+00	3.4E-07	1	0.0E+00	3.0E-03	0E+00							0.0E+00	4.8E-09	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	3.4E-07	1	0.0E+00	5.0E-04	0E+00							0.0E+00	4.8E-09	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	6.3E-02	3.4E-07	1	2.1E-08	1.3E-05	2E-03							6.3E-02	4.8E-09	1	3.0E-10	9.1E+00	3E-09
34	Indeno(1,2,3-c	3.2E-01	3.4E-07	1	1.1E-07	4.0E-02	3E-06							3.2E-01	4.8E-09	1	1.5E-09	7.3E+00	1E-08
35	Lead	1.7E+02	3.4E-07	1	5.7E-05	NA	NA							1.7E+02	4.8E-09	1	8.0E-07	NA	NA
36	Mercury, inorg	1.9E-01	3.4E-07	1	6.4E-08	3.0E-04	2E-04							1.9E-01	4.8E-09	1	9.0E-10	NA	NA
37	Naphthalene	5.5E-01	3.4E-07	1	1.9E-07	4.0E-02	5E-06							5.5E-01	4.8E-09	1	2.6E-09	NA	NA
38	Nickel	1.7E+01	3.4E-07	1	5.9E-06	2.0E-02	3E-04							1.7E+01	4.8E-09	1	8.3E-08	NA	NA
39	Nitrate	--	3.4E-07	1	0.0E+00	1.6E+00	0E+00							--	4.8E-09	1	0.0E+00	NA	NA
40	Nitrite	5.7E+00	3.4E-07	1	1.9E-06	1.0E-01	2E-05							5.7E+00	4.8E-09	1	2.7E-08	NA	NA
41	PCB 1260	4.4E-01	3.4E-07	1	1.5E-07	7.0E-05	2E-03							4.4E-01	4.8E-09	1	2.1E-09	7.7E+00	2E-08
42	Phenanthrene	4.6E-01	3.4E-07	1	1.6E-07	4.0E-02	4E-06							4.6E-01	4.8E-09	1	2.2E-09	NA	NA
43	Pyrene	2.2E+00	3.4E-07	1	7.6E-07	3.0E-01	3E-06							2.2E+00	4.8E-09	1	1.1E-08	NA	NA
44	Silver	5.5E-02	3.4E-07	1	1.9E-08	5.0E-03	4E-06							5.5E-02	4.8E-09	1	2.6E-10	NA	NA

45	Sulfide	2.6E+02	3.4E-07	1	9.0E-05	NA	NA	2.6E+02	4.8E-09	1	1.3E-06	NA	NA
46	Tetrachloroeth	0.0E+00	3.4E-07	1	0.0E+00	1.0E-01	0E+00	0.0E+00	4.8E-09	1	0.0E+00	5.2E-02	0E+00
47	Tetrazene	1.0E+00	3.4E-07	1	3.5E-07	NA	NA	1.0E+00	4.8E-09	1	4.9E-09	NA	NA
48	Toluene	0.0E+00	3.4E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.8E-09	1	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	3.4E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.8E-09	1	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	0.0E+00	3.4E-07	1	0.0E+00	NA	NA	0.0E+00	4.8E-09	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	3.4E-07	1	0.0E+00	4.0E+00	0E+00	0.0E+00	4.8E-09	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: CONST. WORKER 2

EXPOSURE POINT: ZONE 4-EXC
MEDIUM: DUST (PM10)
ROUTE: INHALATION

HIFs = 1.4E-02
HIFc = 0.0E+00
HIFl = 2.0E-04

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP7
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	2.2E-06	1.4E-02	1	3.0E-08	NA	NA		0.0E+00		0.0E+00		ERR	2.2E-06	2.0E-04	1	4.3E-10	NA	NA
2	Acenaphthylene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
3	Aldrin	3.8E-08	1.4E-02	1	5.3E-10	NA	NA							3.8E-08	2.0E-04	1	7.6E-12	1.7E+01	1E-10
4	Alpha-chlordan	1.5E-07	1.4E-02	1	2.0E-09	NA	NA							1.5E-07	2.0E-04	1	2.9E-11	1.3E+00	4E-11
5	Alpha-endosulf	3.4E-08	1.4E-02	1	4.8E-10	NA	NA							3.4E-08	2.0E-04	1	6.8E-12	NA	NA
6	Anthracene	5.6E-06	1.4E-02	1	7.9E-08	NA	NA							5.6E-06	2.0E-04	1	1.1E-09	NA	NA
7	Benzene	0.0E+00	1.4E-02	1	0.0E+00	9.1E-03	0E+00							0.0E+00	2.0E-04	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.9E-06	1.4E-02	1	5.4E-08	NA	NA							3.9E-06	2.0E-04	1	7.8E-10	NA	NA
9	Benzo(a)pyrene	4.7E-06	1.4E-02	1	6.6E-08	NA	NA							4.7E-06	2.0E-04	1	9.4E-10	NA	NA
10	Benzo(b)fluora	3.3E-06	1.4E-02	1	4.6E-08	NA	NA							3.3E-06	2.0E-04	1	6.6E-10	NA	NA
11	Benzo(g,h,i)pe	2.8E-06	1.4E-02	1	3.9E-08	NA	NA							2.8E-06	2.0E-04	1	5.6E-10	NA	NA
12	Benzo(k)fluora	3.0E-06	1.4E-02	1	4.2E-08	NA	NA							3.0E-06	2.0E-04	1	5.9E-10	NA	NA
13	Beta-endosulfa	3.1E-08	1.4E-02	1	4.4E-10	NA	NA							3.1E-08	2.0E-04	1	6.3E-12	NA	NA
14	Boron	5.3E-05	1.4E-02	1	7.4E-07	5.7E-03	1E-04							5.3E-05	2.0E-04	1	1.1E-08	NA	NA
15	Cadmium (food	3.4E-06	1.4E-02	1	4.8E-08	NA	NA							3.4E-06	2.0E-04	1	6.9E-10	6.1E+00	4E-09
16	Cadmium (wate	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
17	Chlordane	5.0E-06	1.4E-02	1	6.9E-08	NA	NA							5.0E-06	2.0E-04	1	9.9E-10	1.3E+00	1E-09
18	Chromium (VI)	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	4.2E+01	0E+00
19	Chrysene	5.0E-06	1.4E-02	1	6.9E-08	NA	NA							5.0E-06	2.0E-04	1	9.9E-10	NA	NA
20	Cyanide (free)	1.6E-06	1.4E-02	1	2.2E-08	2.9E-04	8E-05							1.6E-06	2.0E-04	1	3.2E-10	NA	NA
21	DDD, 4,4'-	6.2E-07	1.4E-02	1	8.6E-09	NA	NA							6.2E-07	2.0E-04	1	1.2E-10	NA	NA
22	DDE, 4,4'-	1.2E-06	1.4E-02	1	1.7E-08	NA	NA							1.2E-06	2.0E-04	1	2.4E-10	NA	NA
23	DDT, 4,4'-	3.1E-06	1.4E-02	1	4.3E-08	NA	NA							3.1E-06	2.0E-04	1	6.2E-10	3.4E-01	2E-10
24	Dibenz(a,h)ant	1.1E-06	1.4E-02	1	1.6E-08	NA	NA							1.1E-06	2.0E-04	1	2.3E-10	NA	NA
25	Dieldrin	1.1E-07	1.4E-02	1	1.6E-09	NA	NA							1.1E-07	2.0E-04	1	2.2E-11	1.6E+01	4E-10
26	Dimethylbenzen	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
27	Endrin	1.5E-06	1.4E-02	1	2.1E-08	NA	NA							1.5E-06	2.0E-04	1	3.0E-10	NA	NA
28	Fluoranthene	8.1E-06	1.4E-02	1	1.1E-07	NA	NA							8.1E-06	2.0E-04	1	1.6E-09	NA	NA
29	Fluorene	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
30	Gamma-chlordan	1.6E-07	1.4E-02	1	2.2E-09	NA	NA							1.6E-07	2.0E-04	1	3.2E-11	1.3E+00	4E-11
31	Gamma-hexachlo	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
32	Heptachlor	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	3.1E-07	1.4E-02	1	4.4E-09	NA	NA							3.1E-07	2.0E-04	1	6.3E-11	9.1E+00	6E-10
34	Indeno(1,2,3-c	1.6E-06	1.4E-02	1	2.3E-08	NA	NA							1.6E-06	2.0E-04	1	3.2E-10	NA	NA
35	Lead	8.3E-04	1.4E-02	1	1.2E-05	NA	NA							8.3E-04	2.0E-04	1	1.7E-07	NA	NA
36	Mercury, inorg	9.4E-07	1.4E-02	1	1.3E-08	NA	NA							9.4E-07	2.0E-04	1	1.9E-10	NA	NA
37	Naphthalene	2.8E-06	1.4E-02	1	3.9E-08	NA	NA							2.8E-06	2.0E-04	1	5.5E-10	NA	NA
38	Nickel	8.7E-05	1.4E-02	1	1.2E-06	NA	NA							8.7E-05	2.0E-04	1	1.7E-08	8.4E-01	1E-08
39	Nitrate	0.0E+00	1.4E-02	1	0.0E+00	NA	NA							0.0E+00	2.0E-04	1	0.0E+00	NA	NA
40	Nitrite	2.8E-05	1.4E-02	1	4.0E-07	NA	NA							2.8E-05	2.0E-04	1	5.7E-09	NA	NA
41	PCB 1260	2.2E-06	1.4E-02	1	3.1E-08	NA	NA							2.2E-06	2.0E-04	1	4.4E-10	NA	NA
42	Phenanthrene	2.3E-06	1.4E-02	1	3.2E-08	NA	NA							2.3E-06	2.0E-04	1	4.6E-10	NA	NA
43	Pyrene	1.1E-05	1.4E-02	1	1.6E-07	NA	NA							1.1E-05	2.0E-04	1	2.2E-09	NA	NA
44	Silver	2.8E-07	1.4E-02	1	3.9E-09	NA	NA							2.8E-07	2.0E-04	1	5.5E-11	NA	NA

45	Sulfide	1.3E-03	1.4E-02	1	1.8E-05	NA	NA	1.3E-03	2.0E-04	1	2.6E-07	NA	NA
46	Tetrachloroeth	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	2.0E-03	0E+00
47	Tetrazene	5.1E-06	1.4E-02	1	7.1E-08	NA	NA	5.1E-06	2.0E-04	1	1.0E-09	NA	NA
48	Toluene	0.0E+00	1.4E-02	1	0.0E+00	5.7E-01	0E+00	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	6.0E-03	0E+00
50	Uranium (solub	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	1.4E-02	1	0.0E+00	NA	NA	0.0E+00	2.0E-04	1	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP7
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
CONST. WORKER 2

SUBCHRONIC RISK SUMMARY

FUTURE
CONST. WORKER 2

	SUBCHRONIC DAILY INTAKE (mg/kg/day)						SUBCHRONIC HAZARD QUOTIENT					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 4-EXC	ZONE 4-EXC	0	0	0	0	ZONE 4-EXC	ZONE 4-EXC	0	0	0	0
	SOIL (0-12'	DUST (PM10)	0	0	0	0	SOIL (0-12'	DUST (PM10)	0	0	0	0
	ORAL	INHALATION	0	0	0	0	ORAL	INHALATION	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	1.5E-07	3.0E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2E-07	NA	0E+00	0E+00	0E+00	0E+00
2 Acenaphthylene	0.0E+00	0.0E+00					0E+00	NA				
3 Aldrin	2.6E-09	5.3E-10					9E-05	NA				
4 Alpha-chlordan	9.9E-09	2.0E-09					2E-04	NA				
5 Alpha-endosulf	2.3E-09	4.8E-10					1E-05	NA				
6 Anthracene	3.8E-07	7.9E-08					1E-07	NA				
7 Benzene	0.0E+00	0.0E+00					0E+00	0E+00				
8 Benzo(a)anthra	2.6E-07	5.4E-08					7E-06	NA				
9 Benzo(a)pyrene	3.2E-07	6.6E-08					8E-06	NA				
10 Benzo(b)fluora	2.2E-07	4.6E-08					6E-06	NA				
11 Benzo(g,h,i)pe	1.9E-07	3.9E-08					5E-06	NA				
12 Benzo(k)fluora	2.0E-07	4.2E-08					5E-06	NA				
13 Beta-endosulfa	2.1E-09	4.4E-10					1E-05	NA				
14 Boron	3.6E-06	7.4E-07					4E-05	1E-04				
15 Cadmium (food	2.3E-07	4.8E-08					NA	NA				
16 Cadmium (wate	0.0E+00	0.0E+00					NA	NA				
17 Chlordane	3.4E-07	6.9E-08					6E-03	NA				
18 Chromium (VI)	0.0E+00	0.0E+00					0E+00	NA				
19 Chrysene	3.4E-07	6.9E-08					8E-06	NA				
20 Cyanide (free)	1.1E-07	2.2E-08					5E-06	8E-05				
21 DDD, 4,4'-	4.2E-08	8.6E-09					NA	NA				
22 DDE, 4,4'-	8.0E-08	1.7E-08					NA	NA				
23 DDT, 4,4'-	2.1E-07	4.3E-08					4E-04	NA				
24 Dibenz(a,h)ant	7.7E-08	1.6E-08					2E-06	NA				
25 Dieldrin	7.6E-09	1.6E-09					2E-04	NA				
26 Dimethylbenzen	0.0E+00	0.0E+00					0E+00	NA				
27 Endrin	1.0E-07	2.1E-08					3E-04	NA				
28 Fluoranthene	5.5E-07	1.1E-07					1E-06	NA				
29 Fluorene	0.0E+00	0.0E+00					0E+00	NA				
30 Gamma-chlordan	1.1E-08	2.2E-09					2E-04	NA				
31 Gamma-hexachlo	0.0E+00	0.0E+00					0E+00	NA				
32 Heptachlor	0.0E+00	0.0E+00					0E+00	NA				
33 Heptachlor epo	2.1E-08	4.4E-09					2E-03	NA				
34 Indeno(1,2,3-c	1.1E-07	2.3E-08					3E-06	NA				
35 Lead	5.7E-05	1.2E-05					NA	NA				
36 Mercury, inorg	6.4E-08	1.3E-08					2E-04	NA				
37 Naphthalene	1.9E-07	3.9E-08					5E-06	NA				
38 Nickel	5.9E-06	1.2E-06					3E-04	NA				
39 Nitrate	0.0E+00	0.0E+00					0E+00	NA				
40 Nitrite	1.9E-06	4.0E-07					2E-05	NA				
41 PCB 1260	1.5E-07	3.1E-08					2E-03	NA				
42 Phenanthrene	1.6E-07	3.2E-08					4E-06	NA				
43 Pyrene	7.6E-07	1.6E-07					3E-06	NA				
44 Silver	1.9E-08	3.9E-09					4E-06	NA				
45 Sulfide	9.0E-05	1.8E-05					NA	NA				
46 Tetrachloroeth	0.0E+00	0.0E+00					0E+00	NA				
47 Tetrazene	3.5E-07	7.1E-08					NA	NA				

48 Toluene	0.0E+00	0.0E+00	0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	NA				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	0E+00	NA				
PATHWAY SUM (HI)			1E-02	2E-04	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL			1E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP7
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
CONST. WORKER 2

		LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-EXC	ZONE 4-EXC	0	0	0	0
		SOIL (0-12'	DUST (PM10)	0	0	0	0
		ORAL	INHALATION	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	2.1E-09	4.3E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00				
3	Aldrin	3.7E-11	7.6E-12				
4	Alpha-chlordan	1.4E-10	2.9E-11				
5	Alpha-endosulf	3.3E-11	6.8E-12				
6	Anthracene	5.4E-09	1.1E-09				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	3.7E-09	7.8E-10				
9	Benzo(a)pyrene	4.5E-09	9.4E-10				
10	Benzo(b)fluora	3.2E-09	6.6E-10				
11	Benzo(g,h,i)pe	2.7E-09	5.6E-10				
12	Benzo(k)fluora	2.8E-09	5.9E-10				
13	Beta-endosulfa	3.0E-11	6.3E-12				
14	Boron	5.1E-08	1.1E-08				
15	Cadmium (food	3.3E-09	6.9E-10				
16	Cadmium (wate	0.0E+00	0.0E+00				
17	Chlordane	4.8E-09	9.9E-10				
18	Chromium (VI)	0.0E+00	0.0E+00				
19	Chrysene	4.8E-09	9.9E-10				
20	Cyanide (free)	1.5E-09	3.2E-10				
21	DDD, 4,4'-	5.9E-10	1.2E-10				
22	DDE, 4,4'-	1.1E-09	2.4E-10				
23	DDT, 4,4'-	3.0E-09	6.2E-10				
24	Dibenz(a,h)ant	1.1E-09	2.3E-10				
25	Dieldrin	1.1E-10	2.2E-11				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	1.4E-09	3.0E-10				
28	Fluoranthene	7.8E-09	1.6E-09				
29	Fluorene	0.0E+00	0.0E+00				
30	Gamma-chlordan	1.5E-10	3.2E-11				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	3.0E-10	6.3E-11				
34	Indeno(1,2,3-c	1.5E-09	3.2E-10				
35	Lead	8.0E-07	1.7E-07				
36	Mercury, inorg	9.0E-10	1.9E-10				
37	Naphthalene	2.6E-09	5.5E-10				
38	Nickel	8.3E-08	1.7E-08				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	2.7E-08	5.7E-09				
41	PCB 1260	2.1E-09	4.4E-10				
42	Phenanthrene	2.2E-09	4.6E-10				
43	Pyrene	1.1E-08	2.2E-09				
44	Silver	2.6E-10	5.5E-11				
45	Sulfide	1.3E-06	2.6E-07				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	4.9E-09	1.0E-09				

LIFETIME RISK SUMMARY

FUTURE
CONST. WORKER 2

		LIFETIME EXCESS CANCER RISK					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-EXC	ZONE 4-EXC	0	0	0	0
		SOIL (0-12'	DUST (PM10)	0	0	0	0
		ORAL	INHALATION	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	6E-10	1E-10				
4	Alpha-chlordan	2E-10	4E-11				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	3E-08	NA				
9	Benzo(a)pyrene	3E-08	NA				
10	Benzo(b)fluora	2E-08	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	2E-08	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	4E-09				
16	Cadmium (wate	NA	NA				
17	Chlordane	6E-09	1E-09				
18	Chromium (VI)	NA	0E+00				
19	Chrysene	3E-08	NA				
20	Cyanide (free)	NA	NA				
21	DDD, 4,4'-	1E-10	NA				
22	DDE, 4,4'-	4E-10	NA				
23	DDT, 4,4'-	1E-09	2E-10				
24	Dibenz(a,h)ant	8E-09	NA				
25	Dieldrin	2E-09	4E-10				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	2E-10	4E-11				
31	Gamma-hexachlo	0E+00	NA				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	3E-09	6E-10				
34	Indeno(1,2,3-c	1E-08	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	1E-08				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	2E-08	NA				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			2E-07	2E-08	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			2E-07					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP8
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: COMM. WORKER 1

EXPOSURE POINT: ZONE 1-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 0.0E+00
HIFc = 4.9E-07
HIFl = 1.7E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene		0.0E+00		0.0E+00		ERR	0.0E+00	4.9E-07	1	0.0E+00	6.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
2	Acenaphthylene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
3	Aldrin							0.0E+00	4.9E-07	1	0.0E+00	3.0E-05	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordane							1.3E-01	4.9E-07	1	6.5E-08	6.0E-05	1E-03	1.3E-01	1.7E-07	1	2.2E-08	1.3E+00	3E-08
5	Alpha-endosulfan							0.0E+00	4.9E-07	1	0.0E+00	5.0E-05	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
6	Anthracene							0.0E+00	4.9E-07	1	0.0E+00	3.0E-01	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
7	Benzene							0.0E+00	4.9E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthracene							3.7E-01	4.9E-07	1	1.8E-07	4.0E-02	5E-06	3.7E-01	1.7E-07	1	6.3E-08	7.3E+00	5E-07
9	Benzo(a)pyrene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluoranthene							5.0E-01	4.9E-07	1	2.5E-07	4.0E-02	6E-06	5.0E-01	1.7E-07	1	8.5E-08	7.3E+00	6E-07
11	Benzo(g,h,i)perylene							5.0E-01	4.9E-07	1	2.4E-07	4.0E-02	6E-06	5.0E-01	1.7E-07	1	8.4E-08	NA	NA
12	Benzo(k)fluoranthene							4.6E-01	4.9E-07	1	2.3E-07	4.0E-02	6E-06	4.6E-01	1.7E-07	1	7.9E-08	7.3E+00	6E-07
13	Beta-endosulfan							3.3E-03	4.9E-07	1	1.6E-09	5.0E-05	3E-05	3.3E-03	1.7E-07	1	5.7E-10	NA	NA
14	Boron							--	4.9E-07	1	0.0E+00	9.0E-02	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
15	Cadmium (food,soil)							0.0E+00	4.9E-07	1	0.0E+00	1.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
16	Cadmium (water)							--	4.9E-07	1	0.0E+00	5.0E-04	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
17	Chlordane							1.7E-01	4.9E-07	1	8.4E-08	6.0E-05	1E-03	1.7E-01	1.7E-07	1	2.9E-08	1.3E+00	4E-08
18	Chromium (VI)							0.0E+00	4.9E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
19	Chrysene							2.8E-01	4.9E-07	1	1.4E-07	4.0E-02	3E-06	2.8E-01	1.7E-07	1	4.7E-08	7.3E+00	3E-07
20	Cyanide (free)							0.0E+00	4.9E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
21	DDD, 4,4'-							2.6E-02	4.9E-07	1	1.3E-08	NA	NA	2.6E-02	1.7E-07	1	4.5E-09	2.4E-01	1E-09
22	DDE, 4,4'-							8.3E-02	4.9E-07	1	4.1E-08	NA	NA	8.3E-02	1.7E-07	1	1.4E-08	3.4E-01	5E-09
23	DDT, 4,4'-							9.0E-02	4.9E-07	1	4.4E-08	5.0E-04	9E-05	9.0E-02	1.7E-07	1	1.5E-08	3.4E-01	5E-09
24	Dibenz(a,h)anthracene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin							2.7E-02	4.9E-07	1	1.3E-08	5.0E-05	3E-04	2.7E-02	1.7E-07	1	4.5E-09	1.6E+01	7E-08
26	Dimethylbenzene, 1,3-							0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
27	Endrin							4.6E-02	4.9E-07	1	2.2E-08	3.0E-04	7E-05	4.6E-02	1.7E-07	1	7.8E-09	NA	NA
28	Fluoranthene							7.8E-01	4.9E-07	1	3.8E-07	4.0E-02	1E-05	7.8E-01	1.7E-07	1	1.3E-07	NA	NA
29	Fluorene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
30	Gamma-chlordane							0.0E+00	4.9E-07	1	0.0E+00	6.0E-05	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlorohexane							0.0E+00	4.9E-07	1	0.0E+00	3.0E-04	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor							3.1E-03	4.9E-07	1	1.5E-09	5.0E-04	3E-06	3.1E-03	1.7E-07	1	5.3E-10	4.5E+00	2E-09
33	Heptachlor epoxide							1.7E-02	4.9E-07	1	8.4E-09	1.3E-05	6E-04	1.7E-02	1.7E-07	1	2.9E-09	9.1E+00	3E-08
34	Indeno(1,2,3-cd)pyrene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	7.3E+00	0E+00
35	Lead							6.8E+01	4.9E-07	1	3.3E-05	NA	NA	6.8E+01	1.7E-07	1	1.2E-05	NA	NA
36	Mercury, inorganic							1.1E-01	4.9E-07	1	5.2E-08	3.0E-04	2E-04	1.1E-01	1.7E-07	1	1.8E-08	NA	NA
37	Naphthalene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
38	Nickel							2.8E+01	4.9E-07	1	1.4E-05	2.0E-02	7E-04	2.8E+01	1.7E-07	1	4.8E-06	NA	NA
39	Nitrate							--	4.9E-07	1	0.0E+00	1.6E+00	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
40	Nitrite							--	4.9E-07	1	0.0E+00	1.0E-01	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
41	PCB 1260							1.5E-01	4.9E-07	1	7.6E-08	7.0E-05	1E-03	1.5E-01	1.7E-07	1	2.6E-08	7.7E+00	2E-07
42	Phenanthrene							5.3E-01	4.9E-07	1	2.6E-07	4.0E-02	6E-06	5.3E-01	1.7E-07	1	9.0E-08	NA	NA
43	Pyrene							9.2E-01	4.9E-07	1	4.5E-07	3.0E-02	1E-05	9.2E-01	1.7E-07	1	1.6E-07	NA	NA
44	Silver							4.5E-02	4.9E-07	1	2.2E-08	5.0E-03	4E-06	4.5E-02	1.7E-07	1	7.7E-09	NA	NA

45 Sulfide	--	4.9E-07	1	0.0E+00	NA	NA	--	1.7E-07	1	0.0E+00	NA	NA
46 Tetrachloroethene	0.0E+00	4.9E-07	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	4.9E-07	1	0.0E+00	NA	NA	--	1.7E-07	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	4.9E-07	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
49 Trichloroethene	0.0E+00	4.9E-07	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.1E-02	0E+00
50 Uranium (soluble salts)	0.0E+00	4.9E-07	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
51 Xylenes (total)	0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP8
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
COMM. WORKER 1

CHRONIC RISK SUMMARY

FUTURE
COMM. WORKER 1

		CHRONIC DAILY INTAKE (mg/kg/day)						CHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 1-NON	0	0	0	0	0	ZONE 1-NON	0	0	0	0	0
		SOIL (0-2')	0	0	0	0	0	SOIL (0-2')	0	0	0	0	0
		ORAL	0	0	0	0	0	ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00						0E+00					
3	Aldrin	0.0E+00						0E+00					
4	Alpha-chlordan	6.5E-08						1E-03					
5	Alpha-endosulf	0.0E+00						0E+00					
6	Anthracene	0.0E+00						0E+00					
7	Benzene	0.0E+00						0E+00					
8	Benzo(a)anthra	1.8E-07						5E-06					
9	Benzo(a)pyrene	0.0E+00						0E+00					
10	Benzo(b)fluora	2.5E-07						6E-06					
11	Benzo(g,h,i)pe	2.4E-07						6E-06					
12	Benzo(k)fluora	2.3E-07						6E-06					
13	Beta-endosulfa	1.6E-09						3E-05					
14	Boron	0.0E+00						0E+00					
15	Cadmium (food	0.0E+00						0E+00					
16	Cadmium (wate	0.0E+00						0E+00					
17	Chlordane	8.4E-08						1E-03					
18	Chromium (VI)	0.0E+00						0E+00					
19	Chrysene	1.4E-07						3E-06					
20	Cyanide (free)	0.0E+00						0E+00					
21	DDD, 4,4'-	1.3E-08						NA					
22	DDE, 4,4'-	4.1E-08						NA					
23	DDT, 4,4'-	4.4E-08						9E-05					
24	Dibenz(a,h)ant	0.0E+00						0E+00					
25	Dieldrin	1.3E-08						3E-04					
26	Dimethylbenzen	0.0E+00						0E+00					
27	Endrin	2.2E-08						7E-05					
28	Fluoranthene	3.8E-07						1E-05					
29	Fluorene	0.0E+00						0E+00					
30	Gamma-chlordan	0.0E+00						0E+00					
31	Gamma-hexachlo	0.0E+00						0E+00					
32	Heptachlor	1.5E-09						3E-06					
33	Heptachlor epo	8.4E-09						6E-04					
34	Indeno(1,2,3-c	0.0E+00						0E+00					
35	Lead	3.3E-05						NA					
36	Mercury, inorg	5.2E-08						2E-04					
37	Naphthalene	0.0E+00						0E+00					
38	Nickel	1.4E-05						7E-04					
39	Nitrate	0.0E+00						0E+00					
40	Nitrite	0.0E+00						0E+00					
41	PCB 1260	7.6E-08						1E-03					
42	Phenanthrene	2.6E-07						6E-06					
43	Pyrene	4.5E-07						1E-05					
44	Silver	2.2E-08						4E-06					
45	Sulfide	0.0E+00						NA					
46	Tetrachloroeth	0.0E+00						0E+00					
47	Tetrazene	0.0E+00						NA					

48 Toluene	0.0E+00		0E+00				
49 Trichloroethen	0.0E+00		0E+00				
50 Uranium (solub	0.0E+00		0E+00				
51 Xylenes (total	0.0E+00		0E+00				
		PATHWAY SUM (HI)	5E-03	0E+00	0E+00	0E+00	0E+00	0E+00
		POPULATION TOTAL	5E-03					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POPB
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
COMM. WORKER 1

LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)

	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 1-NON	0	0	0	0	0
	SOIL (0-2')	0	0	0	0	0
	ORAL	0	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2 Acenaphthylene	0.0E+00					
3 Aldrin	0.0E+00					
4 Alpha-chlordan	2.2E-08					
5 Alpha-endosulf	0.0E+00					
6 Anthracene	0.0E+00					
7 Benzene	0.0E+00					
8 Benzo(a)anthra	6.3E-08					
9 Benzo(a)pyrene	0.0E+00					
10 Benzo(b)fluora	8.5E-08					
11 Benzo(g,h,i)pe	8.4E-08					
12 Benzo(k)fluora	7.9E-08					
13 Beta-endosulfa	5.7E-10					
14 Boron	0.0E+00					
15 Cadmium (food	0.0E+00					
16 Cadmium (wate	0.0E+00					
17 Chlordane	2.9E-08					
18 Chromium (VI)	0.0E+00					
19 Chrysene	4.7E-08					
20 Cyanide (free)	0.0E+00					
21 DDD, 4,4'-	4.5E-09					
22 DDE, 4,4'-	1.4E-08					
23 DDT, 4,4'-	1.5E-08					
24 Dibenz(a,h)ant	0.0E+00					
25 Dieldrin	4.5E-09					
26 Dimethylbenzen	0.0E+00					
27 Endrin	7.8E-09					
28 Fluoranthene	1.3E-07					
29 Fluorene	0.0E+00					
30 Gamma-chlordan	0.0E+00					
31 Gamma-hexachlo	0.0E+00					
32 Heptachlor	5.3E-10					
33 Heptachlor epo	2.9E-09					
34 Indeno(1,2,3-c	0.0E+00					
35 Lead	1.2E-05					
36 Mercury, inorg	1.8E-08					
37 Naphthalene	0.0E+00					
38 Nickel	4.8E-06					
39 Nitrate	0.0E+00					
40 Nitrite	0.0E+00					
41 PCB 1260	2.6E-08					
42 Phenanthrene	9.0E-08					
43 Pyrene	1.6E-07					
44 Silver	7.7E-09					
45 Sulfide	0.0E+00					
46 Tetrachloroeth	0.0E+00					
47 Tetrazene	0.0E+00					

LIFETIME RISK SUMMARY

FUTURE
COMM. WORKER 1

LIFETIME EXCESS CANCER RISK

	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 1-NON	0	0	0	0	0
	SOIL (0-2')	0	0	0	0	0
	ORAL	0	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	NA	0E+00	0E+00	0E+00	0E+00	0E+00
2 Acenaphthylene	NA					
3 Aldrin	0E+00					
4 Alpha-chlordan	3E-08					
5 Alpha-endosulf	NA					
6 Anthracene	NA					
7 Benzene	0E+00					
8 Benzo(a)anthra	5E-07					
9 Benzo(a)pyrene	0E+00					
10 Benzo(b)fluora	6E-07					
11 Benzo(g,h,i)pe	NA					
12 Benzo(k)fluora	6E-07					
13 Beta-endosulfa	NA					
14 Boron	NA					
15 Cadmium (food	NA					
16 Cadmium (wate	NA					
17 Chlordane	4E-08					
18 Chromium (VI)	NA					
19 Chrysene	3E-07					
20 Cyanide (free)	NA					
21 DDD, 4,4'-	1E-09					
22 DDE, 4,4'-	5E-09					
23 DDT, 4,4'-	5E-09					
24 Dibenz(a,h)ant	0E+00					
25 Dieldrin	7E-08					
26 Dimethylbenzen	NA					
27 Endrin	NA					
28 Fluoranthene	NA					
29 Fluorene	NA					
30 Gamma-chlordan	0E+00					
31 Gamma-hexachlo	0E+00					
32 Heptachlor	2E-09					
33 Heptachlor epo	3E-08					
34 Indeno(1,2,3-c	0E+00					
35 Lead	NA					
36 Mercury, inorg	NA					
37 Naphthalene	NA					
38 Nickel	NA					
39 Nitrate	NA					
40 Nitrite	NA					
41 PCB 1260	2E-07					
42 Phenanthrene	NA					
43 Pyrene	NA					
44 Silver	NA					
45 Sulfide	NA					
46 Tetrachloroeth	0E+00					
47 Tetrazene	NA					

48 Toluene	0.0E+00		NA					
49 Trichloroethen	0.0E+00		0E+00					
50 Uranium (solub	0.0E+00		NA					
51 Xylenes (total	0.0E+00		NA					
		TOTAL PATHWAY CANCER RISK	2E-06	0E+00	0E+00	0E+00	0E+00	0E+00
		POPULATION TOTAL EXCESS RISK	2E-06					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: COMM. WORKER 2

EXPOSURE POINT: ZONE 2-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 0.0E+00
HIFc = 4.9E-07
HIFl = 1.7E-07

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP9
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene		0.0E+00		0.0E+00		ERR	3.2E-01	4.9E-07	1	1.6E-07	6.0E-02	3E-06	3.2E-01	1.7E-07	1	5.5E-08	NA	NA
2	Acenaphthylene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
3	Aldrin							5.1E-02	4.9E-07	1	2.5E-08	3.0E-05	8E-04	5.1E-02	1.7E-07	1	8.7E-09	1.7E+01	1E-07
4	Alpha-chlordane							3.8E-01	4.9E-07	1	1.9E-07	6.0E-05	3E-03	3.8E-01	1.7E-07	1	6.5E-08	1.3E+00	8E-08
5	Alpha-endosulfan							6.0E-03	4.9E-07	1	3.0E-09	5.0E-05	6E-05	6.0E-03	1.7E-07	1	1.0E-09	NA	NA
6	Anthracene							8.6E-01	4.9E-07	1	4.2E-07	3.0E-01	1E-06	8.6E-01	1.7E-07	1	1.5E-07	NA	NA
7	Benzene							4.7E-02	4.9E-07	1	2.3E-08	5.0E-03	5E-06	4.7E-02	1.7E-07	1	7.9E-09	2.9E-02	2E-10
8	Benzo(a)anthracene							1.7E+00	4.9E-07	1	8.5E-07	4.0E-02	2E-05	1.7E+00	1.7E-07	1	2.9E-07	7.3E+00	2E-06
9	Benzo(a)pyrene							1.8E+00	4.9E-07	1	9.0E-07	4.0E-02	2E-05	1.8E+00	1.7E-07	1	3.1E-07	7.3E+00	2E-06
10	Benzo(b)fluoranthene							1.9E+00	4.9E-07	1	9.1E-07	4.0E-02	2E-05	1.9E+00	1.7E-07	1	3.2E-07	7.3E+00	2E-06
11	Benzo(g,h,i)perylene							1.7E+00	4.9E-07	1	8.1E-07	4.0E-02	2E-05	1.7E+00	1.7E-07	1	2.8E-07	NA	NA
12	Benzo(k)fluoranthene							1.7E+00	4.9E-07	1	8.4E-07	4.0E-02	2E-05	1.7E+00	1.7E-07	1	2.9E-07	7.3E+00	2E-06
13	Beta-endosulfan							4.7E-02	4.9E-07	1	2.3E-08	5.0E-05	5E-04	4.7E-02	1.7E-07	1	8.1E-09	NA	NA
14	Boron							0.0E+00	4.9E-07	1	0.0E+00	9.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
15	Cadmium (food,soil)							9.7E-01	4.9E-07	1	4.8E-07	1.0E-03	5E-04	9.7E-01	1.7E-07	1	1.7E-07	NA	NA
16	Cadmium (water)							--	4.9E-07	1	0.0E+00	5.0E-04	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
17	Chlordane							8.3E-01	4.9E-07	1	4.0E-07	6.0E-05	7E-03	8.3E-01	1.7E-07	1	1.4E-07	1.3E+00	2E-07
18	Chromium (VI)							0.0E+00	4.9E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
19	Chrysene							1.2E+00	4.9E-07	1	5.9E-07	4.0E-02	1E-05	1.2E+00	1.7E-07	1	2.0E-07	7.3E+00	1E-06
20	Cyanide (free)							6.7E-01	4.9E-07	1	3.3E-07	2.0E-02	2E-05	6.7E-01	1.7E-07	1	1.1E-07	NA	NA
21	DDD, 4,4'-							1.2E-01	4.9E-07	1	6.0E-08	NA	NA	1.2E-01	1.7E-07	1	2.1E-08	2.4E-01	5E-09
22	DDE, 4,4'-							2.2E-01	4.9E-07	1	1.1E-07	NA	NA	2.2E-01	1.7E-07	1	3.7E-08	3.4E-01	1E-08
23	DDT, 4,4'-							2.7E-01	4.9E-07	1	1.3E-07	5.0E-04	3E-04	2.7E-01	1.7E-07	1	4.5E-08	3.4E-01	2E-08
24	Dibenz(a,h)anthracene							3.8E-01	4.9E-07	1	1.9E-07	4.0E-02	5E-06	3.8E-01	1.7E-07	1	6.5E-08	7.3E+00	5E-07
25	Dieldrin							1.8E-01	4.9E-07	1	8.6E-08	5.0E-05	2E-03	1.8E-01	1.7E-07	1	3.0E-08	1.6E+01	5E-07
26	Dimethylbenzene, 1,3-							0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
27	Endrin							1.6E-01	4.9E-07	1	7.6E-08	3.0E-04	3E-04	1.6E-01	1.7E-07	1	2.6E-08	NA	NA
28	Fluoranthene							2.1E+00	4.9E-07	1	1.0E-06	4.0E-02	3E-05	2.1E+00	1.7E-07	1	3.5E-07	NA	NA
29	Fluorene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
30	Gamma-chlordane							4.0E-01	4.9E-07	1	2.0E-07	6.0E-05	3E-03	4.0E-01	1.7E-07	1	6.8E-08	1.3E+00	9E-08
31	Gamma-hexachlorohexane							1.3E-02	4.9E-07	1	6.4E-09	3.0E-04	2E-05	1.3E-02	1.7E-07	1	2.2E-09	1.3E+00	3E-09
32	Heptachlor							2.9E-02	4.9E-07	1	1.4E-08	5.0E-04	3E-05	2.9E-02	1.7E-07	1	4.9E-09	4.5E+00	2E-08
33	Heptachlor epoxide							9.2E-02	4.9E-07	1	4.5E-08	1.3E-05	3E-03	9.2E-02	1.7E-07	1	1.6E-08	9.1E+00	1E-07
34	Indeno(1,2,3-cd)pyrene							2.3E+00	4.9E-07	1	1.2E-06	4.0E-02	3E-05	2.3E+00	1.7E-07	1	4.0E-07	7.3E+00	3E-06
35	Lead							3.9E+02	4.9E-07	1	1.9E-04	NA	NA	3.9E+02	1.7E-07	1	6.6E-05	NA	NA
36	Mercury, inorganic							2.8E-01	4.9E-07	1	1.4E-07	3.0E-04	5E-04	2.8E-01	1.7E-07	1	4.7E-08	NA	NA
37	Naphthalene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
38	Nickel							3.4E+01	4.9E-07	1	1.7E-05	2.0E-02	8E-04	3.4E+01	1.7E-07	1	5.8E-06	NA	NA
39	Nitrate							--	4.9E-07	1	0.0E+00	1.6E+00	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
40	Nitrite							5.3E+00	4.9E-07	1	2.6E-06	1.0E-01	3E-05	5.3E+00	1.7E-07	1	9.0E-07	NA	NA
41	PCB 1260							3.0E-01	4.9E-07	1	1.5E-07	7.0E-05	2E-03	3.0E-01	1.7E-07	1	5.1E-08	7.7E+00	4E-07
42	Phenanthrene							2.7E+00	4.9E-07	1	1.3E-06	4.0E-02	3E-05	2.7E+00	1.7E-07	1	4.7E-07	NA	NA
43	Pyrene							2.7E+00	4.9E-07	1	1.3E-06	3.0E-02	4E-05	2.7E+00	1.7E-07	1	4.6E-07	NA	NA
44	Silver							7.7E-01	4.9E-07	1	3.8E-07	5.0E-03	8E-05	7.7E-01	1.7E-07	1	1.3E-07	NA	NA

45	Sulfide	2.8E+02	4.9E-07	1	1.4E-04	NA	NA	2.8E+02	1.7E-07	1	4.7E-05	NA	NA
46	Tetrachloroethene	2.0E-03	4.9E-07	1	9.8E-10	1.0E-02	1E-07	2.0E-03	1.7E-07	1	3.4E-10	5.2E-02	2E-11
47	Tetrazene	--	4.9E-07	1	0.0E+00	NA	NA	--	1.7E-07	1	0.0E+00	NA	NA
48	Toluene	4.5E-02	4.9E-07	1	2.2E-08	2.0E-01	1E-07	4.5E-02	1.7E-07	1	7.7E-09	NA	NA
49	Trichloroethene	0.0E+00	4.9E-07	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.1E-02	0E+00
50	Uranium (soluble salts)	0.0E+00	4.9E-07	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
51	Xylenes (total)	0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP9
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
COMM. WORKER 2

CHRONIC DAILY INTAKE (mg/kg/day)

		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 2-NON	0	0	0	0	0
		SOIL (0-2')	0	0	0	0	0
		ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1.6E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00					
3	Aldrin	2.5E-08					
4	Alpha-chlordan	1.9E-07					
5	Alpha-endosulf	3.0E-09					
6	Anthracene	4.2E-07					
7	Benzene	2.3E-08					
8	Benzo(a)anthra	8.5E-07					
9	Benzo(a)pyrene	9.0E-07					
10	Benzo(b)fluora	9.1E-07					
11	Benzo(g,h,i)pe	8.1E-07					
12	Benzo(k)fluora	8.4E-07					
13	Beta-endosulfa	2.3E-08					
14	Boron	0.0E+00					
15	Cadmium (food	4.8E-07					
16	Cadmium (wate	0.0E+00					
17	Chlordane	4.0E-07					
18	Chromium (VI)	0.0E+00					
19	Chrysene	5.9E-07					
20	Cyanide (free)	3.3E-07					
21	DDD, 4,4'-	6.0E-08					
22	DDE, 4,4'-	1.1E-07					
23	DDT, 4,4'-	1.3E-07					
24	Dibenz(a,h)ant	1.9E-07					
25	Dieldrin	8.6E-08					
26	Dimethylbenzen	0.0E+00					
27	Endrin	7.6E-08					
28	Fluoranthene	1.0E-06					
29	Fluorene	0.0E+00					
30	Gamma-chlordan	2.0E-07					
31	Gamma-hexachlo	6.4E-09					
32	Heptachlor	1.4E-08					
33	Heptachlor epo	4.5E-08					
34	Indeno(1,2,3-c	1.2E-06					
35	Lead	1.9E-04					
36	Mercury, inorg	1.4E-07					
37	Naphthalene	0.0E+00					
38	Nickel	1.7E-05					
39	Nitrate	0.0E+00					
40	Nitrite	2.6E-06					
41	PCB 1260	1.5E-07					
42	Phenanthrene	1.3E-06					
43	Pyrene	1.3E-06					
44	Silver	3.8E-07					
45	Sulfide	1.4E-04					
46	Tetrachloroeth	9.8E-10					
47	Tetrazene	0.0E+00					

CHRONIC RISK SUMMARY

FUTURE
COMM. WORKER 2

CHRONIC HAZARD QUOTIENT

		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 2-NON	0	0	0	0	0
		SOIL (0-2')	0	0	0	0	0
		ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	3E-06	0E+00	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00					
3	Aldrin	8E-04					
4	Alpha-chlordan	3E-03					
5	Alpha-endosulf	6E-05					
6	Anthracene	1E-06					
7	Benzene	5E-06					
8	Benzo(a)anthra	2E-05					
9	Benzo(a)pyrene	2E-05					
10	Benzo(b)fluora	2E-05					
11	Benzo(g,h,i)pe	2E-05					
12	Benzo(k)fluora	2E-05					
13	Beta-endosulfa	5E-04					
14	Boron	0E+00					
15	Cadmium (food	5E-04					
16	Cadmium (wate	0E+00					
17	Chlordane	7E-03					
18	Chromium (VI)	0E+00					
19	Chrysene	1E-05					
20	Cyanide (free)	2E-05					
21	DDD, 4,4'-	NA					
22	DDE, 4,4'-	NA					
23	DDT, 4,4'-	3E-04					
24	Dibenz(a,h)ant	5E-06					
25	Dieldrin	2E-03					
26	Dimethylbenzen	0E+00					
27	Endrin	3E-04					
28	Fluoranthene	3E-05					
29	Fluorene	0E+00					
30	Gamma-chlordan	3E-03					
31	Gamma-hexachlo	2E-05					
32	Heptachlor	3E-05					
33	Heptachlor epo	3E-03					
34	Indeno(1,2,3-c	3E-05					
35	Lead	NA					
36	Mercury, inorg	5E-04					
37	Naphthalene	0E+00					
38	Nickel	8E-04					
39	Nitrate	0E+00					
40	Nitrite	3E-05					
41	PCB 1260	2E-03					
42	Phenanthrene	3E-05					
43	Pyrene	4E-05					
44	Silver	8E-05					
45	Sulfide	NA					
46	Tetrachloroeth	1E-07					
47	Tetrazene	NA					

48 Toluene	2.2E-08		1E-07					
49 Trichloroethen	0.0E+00		0E+00					
50 Uranium (solub	0.0E+00		0E+00					
51 Xylenes (total	0.0E+00		0E+00					
		PATHWAY SUM (HI)	2E-02	0E+00	0E+00	0E+00	0E+00	0E+00
		POPULATION TOTAL	2E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP9
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY — FUTURE COMM. WORKER 2 | LIFETIME RISK SUMMARY — FUTURE COMM. WORKER 2

		LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)						LIFETIME EXCESS CANCER RISK					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 2-NON	0	0	0	0	0	ZONE 2-NON	0	0	0	0	0
		SOIL (0-2')	0	0	0	0	0	SOIL (0-2')	0	0	0	0	0
		ORAL	0	0	0	0	0	ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	5.5E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	NA	0E+00	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00						NA					
3	Aldrin	8.7E-09						1E-07					
4	Alpha-chlordan	6.5E-08						8E-08					
5	Alpha-endosulf	1.0E-09						NA					
6	Anthracene	1.5E-07						NA					
7	Benzene	7.9E-09						2E-10					
8	Benzo(a)anthra	2.9E-07						2E-06					
9	Benzo(a)pyrene	3.1E-07						2E-06					
10	Benzo(b)fluora	3.2E-07						2E-06					
11	Benzo(g,h,i)pe	2.8E-07						NA					
12	Benzo(k)fluora	2.9E-07						2E-06					
13	Beta-endosulfa	8.1E-09						NA					
14	Boron	0.0E+00						NA					
15	Cadmium (food	1.7E-07						NA					
16	Cadmium (wate	0.0E+00						NA					
17	Chlordane	1.4E-07						2E-07					
18	Chromium (VI)	0.0E+00						NA					
19	Chrysene	2.0E-07						1E-06					
20	Cyanide (free)	1.1E-07						NA					
21	DDD, 4,4'-	2.1E-08						5E-09					
22	DDE, 4,4'-	3.7E-08						1E-08					
23	DDT, 4,4'-	4.5E-08						2E-08					
24	Dibenz(a,h)ant	6.5E-08						5E-07					
25	Dieldrin	3.0E-08						5E-07					
26	Dimethylbenzen	0.0E+00						NA					
27	Endrin	2.6E-08						NA					
28	Fluoranthene	3.5E-07						NA					
29	Fluorene	0.0E+00						NA					
30	Gamma-chlordan	6.8E-08						9E-08					
31	Gamma-hexachlo	2.2E-09						3E-09					
32	Heptachlor	4.9E-09						2E-08					
33	Heptachlor epo	1.6E-08						1E-07					
34	Indeno(1,2,3-c	4.0E-07						3E-06					
35	Lead	6.6E-05						NA					
36	Mercury, inorg	4.7E-08						NA					
37	Naphthalene	0.0E+00						NA					
38	Nickel	5.8E-06						NA					
39	Nitrate	0.0E+00						NA					
40	Nitrite	9.0E-07						NA					
41	PCB 1260	5.1E-08						4E-07					
42	Phenanthrene	4.7E-07						NA					
43	Pyrene	4.6E-07						NA					
44	Silver	1.3E-07						NA					
45	Sulfide	4.7E-05						NA					
46	Tetrachloroeth	3.4E-10						2E-11					
47	Tetrazene	0.0E+00						NA					

48 Toluene	7.7E-09		NA					
49 Trichloroethen	0.0E+00		0E+00					
50 Uranium (solub	0.0E+00		NA					
51 Xylenes (total	0.0E+00		NA					
		TOTAL PATHWAY CANCER RISK	1E-05	0E+00	0E+00	0E+00	0E+00	0E+00
		POPULATION TOTAL EXCESS RISK	1E-05					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP10
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: COMM. WORKER 3

EXPOSURE POINT: ZONE 3-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 0.0E+00
HIFc = 4.9E-07
HIFl = 1.7E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene		0.0E+00		0.0E+00		ERR	3.6E-01	4.9E-07	1	1.8E-07	6.0E-02	3E-06	3.6E-01	1.7E-07	1	6.2E-08	NA	NA
2	Acenaphthylene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
3	Aldrin							3.9E-03	4.9E-07	1	1.9E-09	3.0E-05	6E-05	3.9E-03	1.7E-07	1	6.6E-10	1.7E+01	1E-08
4	Alpha-chlordane							2.5E-02	4.9E-07	1	1.2E-08	6.0E-05	2E-04	2.5E-02	1.7E-07	1	4.3E-09	1.3E+00	6E-09
5	Alpha-endosulfan							5.7E-03	4.9E-07	1	2.8E-09	5.0E-05	6E-05	5.7E-03	1.7E-07	1	9.8E-10	NA	NA
6	Anthracene							1.1E+00	4.9E-07	1	5.5E-07	3.0E-01	2E-06	1.1E+00	1.7E-07	1	1.9E-07	NA	NA
7	Benzene							0.0E+00	4.9E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthracene							2.2E+00	4.9E-07	1	1.1E-06	4.0E-02	3E-05	2.2E+00	1.7E-07	1	3.8E-07	7.3E+00	3E-06
9	Benzo(a)pyrene							2.6E+00	4.9E-07	1	1.3E-06	4.0E-02	3E-05	2.6E+00	1.7E-07	1	4.4E-07	7.3E+00	3E-06
10	Benzo(b)fluoranthene							3.0E+00	4.9E-07	1	1.5E-06	4.0E-02	4E-05	3.0E+00	1.7E-07	1	5.0E-07	7.3E+00	4E-06
11	Benzo(g,h,i)perylene							1.9E+00	4.9E-07	1	9.3E-07	4.0E-02	2E-05	1.9E+00	1.7E-07	1	3.2E-07	NA	NA
12	Benzo(k)fluoranthene							2.3E+00	4.9E-07	1	1.1E-06	4.0E-02	3E-05	2.3E+00	1.7E-07	1	3.8E-07	7.3E+00	3E-06
13	Beta-endosulfan							1.3E-01	4.9E-07	1	6.2E-08	5.0E-05	1E-03	1.3E-01	1.7E-07	1	2.2E-08	NA	NA
14	Boron							--	4.9E-07	1	0.0E+00	9.0E-02	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
15	Cadmium (food,soil)							2.8E+00	4.9E-07	1	1.4E-06	1.0E-03	1E-03	2.8E+00	1.7E-07	1	4.7E-07	NA	NA
16	Cadmium (water)							--	4.9E-07	1	0.0E+00	5.0E-04	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
17	Chlordane							5.2E-01	4.9E-07	1	2.5E-07	6.0E-05	4E-03	5.2E-01	1.7E-07	1	8.8E-08	1.3E+00	1E-07
18	Chromium (VI)							0.0E+00	4.9E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
19	Chrysene							2.3E+00	4.9E-07	1	1.1E-06	4.0E-02	3E-05	2.3E+00	1.7E-07	1	4.0E-07	7.3E+00	3E-06
20	Cyanide (free)							0.0E+00	4.9E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
21	DDD, 4,4'-							2.9E-02	4.9E-07	1	1.4E-08	NA	NA	2.9E-02	1.7E-07	1	5.0E-09	2.4E-01	1E-09
22	DDE, 4,4'-							4.0E-02	4.9E-07	1	2.0E-08	NA	NA	4.0E-02	1.7E-07	1	6.9E-09	3.4E-01	2E-09
23	DDT, 4,4'-							1.4E-01	4.9E-07	1	6.9E-08	5.0E-04	1E-04	1.4E-01	1.7E-07	1	2.4E-08	3.4E-01	8E-09
24	Dibenz(a,h)anthracene							2.9E-01	4.9E-07	1	1.4E-07	4.0E-02	4E-06	2.9E-01	1.7E-07	1	5.0E-08	7.3E+00	4E-07
25	Dieldrin							2.0E-02	4.9E-07	1	9.7E-09	5.0E-05	2E-04	2.0E-02	1.7E-07	1	3.4E-09	1.6E+01	5E-08
26	Dimethylbenzene, 1,3-							0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
27	Endrin							7.5E-02	4.9E-07	1	3.7E-08	3.0E-04	1E-04	7.5E-02	1.7E-07	1	1.3E-08	NA	NA
28	Fluoranthene							3.0E+00	4.9E-07	1	1.5E-06	4.0E-02	4E-05	3.0E+00	1.7E-07	1	5.2E-07	NA	NA
29	Fluorene							0.0E+00	4.9E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
30	Gamma-chlordane							0.0E+00	4.9E-07	1	0.0E+00	6.0E-05	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlorohexane							8.8E-03	4.9E-07	1	4.3E-09	3.0E-04	1E-05	8.8E-03	1.7E-07	1	1.5E-09	1.3E+00	2E-09
32	Heptachlor							4.5E-03	4.9E-07	1	2.2E-09	5.0E-04	4E-06	4.5E-03	1.7E-07	1	7.7E-10	4.5E+00	3E-09
33	Heptachlor epoxide							1.2E-02	4.9E-07	1	5.7E-09	1.3E-05	4E-04	1.2E-02	1.7E-07	1	2.0E-09	9.1E+00	2E-08
34	Indeno(1,2,3-cd)pyrene							2.9E+00	4.9E-07	1	1.4E-06	4.0E-02	4E-05	2.9E+00	1.7E-07	1	4.9E-07	7.3E+00	4E-06
35	Lead							2.9E+02	4.9E-07	1	1.4E-04	NA	NA	2.9E+02	1.7E-07	1	4.9E-05	NA	NA
36	Mercury, inorganic							3.5E-01	4.9E-07	1	1.7E-07	3.0E-04	6E-04	3.5E-01	1.7E-07	1	6.0E-08	NA	NA
37	Naphthalene							9.6E-01	4.9E-07	1	4.7E-07	4.0E-02	1E-05	9.6E-01	1.7E-07	1	1.6E-07	NA	NA
38	Nickel							9.9E+01	4.9E-07	1	4.8E-05	2.0E-02	2E-03	9.9E+01	1.7E-07	1	1.7E-05	NA	NA
39	Nitrate							--	4.9E-07	1	0.0E+00	1.6E+00	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
40	Nitrite							--	4.9E-07	1	0.0E+00	1.0E-01	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
41	PCB 1260							1.4E-01	4.9E-07	1	6.7E-08	7.0E-05	1E-03	1.4E-01	1.7E-07	1	2.3E-08	7.7E+00	2E-07
42	Phenanthrene							4.3E+00	4.9E-07	1	2.1E-06	4.0E-02	5E-05	4.3E+00	1.7E-07	1	7.3E-07	NA	NA
43	Pyrene							3.8E+00	4.9E-07	1	1.9E-06	3.0E-02	6E-05	3.8E+00	1.7E-07	1	6.4E-07	NA	NA
44	Silver							4.3E+00	4.9E-07	1	2.1E-06	5.0E-03	4E-04	4.3E+00	1.7E-07	1	7.2E-07	NA	NA

45	Sulfide	1.1E+02	4.9E-07	1	5.2E-05	NA	NA	1.1E+02	1.7E-07	1	1.8E-05	NA	NA
46	Tetrachloroethene	0.0E+00	4.9E-07	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.7E-07	1	0.0E+00	5.2E-02	0E+00
47	Tetrazene	0.0E+00	4.9E-07	1	0.0E+00	NA	NA	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
48	Toluene	0.0E+00	4.9E-07	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA
49	Trichloroethene	0.0E+00	4.9E-07	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.7E-07	1	0.0E+00	1.1E-02	0E+00
50	Uranium (soluble salts)	--	4.9E-07	1	0.0E+00	3.0E-03	0E+00	--	1.7E-07	1	0.0E+00	NA	NA
51	Xylenes (total)	0.0E+00	4.9E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-07	1	0.0E+00	NA	NA

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP10
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
COMM. WORKER 3

CHRONIC RISK SUMMARY

FUTURE
COMM. WORKER 3

	CHRONIC DAILY INTAKE (mg/kg/day)						CHRONIC HAZARD QUOTIENT					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	ZONE 3-NON	0	0	0	0	0	ZONE 3-NON	0	0	0	0	0
	SOIL (0-2')	0	0	0	0	0	SOIL (0-2')	0	0	0	0	0
	ORAL	0	0	0	0	0	ORAL	0	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	1.8E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3E-06	0E+00	0E+00	0E+00	0E+00	0E+00
2 Acenaphthylene	0.0E+00						0E+00					
3 Aldrin	1.9E-09						6E-05					
4 Alpha-chlordan	1.2E-08						2E-04					
5 Alpha-endosulf	2.8E-09						6E-05					
6 Anthracene	5.5E-07						2E-06					
7 Benzene	0.0E+00						0E+00					
8 Benzo(a)anthra	1.1E-06						3E-05					
9 Benzo(a)pyrene	1.3E-06						3E-05					
10 Benzo(b)fluora	1.5E-06						4E-05					
11 Benzo(g,h,i)pe	9.3E-07						2E-05					
12 Benzo(k)fluora	1.1E-06						3E-05					
13 Beta-endosulfa	6.2E-08						1E-03					
14 Boron	0.0E+00						0E+00					
15 Cadmium (food	1.4E-06						1E-03					
16 Cadmium (wate	0.0E+00						0E+00					
17 Chlordane	2.5E-07						4E-03					
18 Chromium (VI)	0.0E+00						0E+00					
19 Chrysene	1.1E-06						3E-05					
20 Cyanide (free)	0.0E+00						0E+00					
21 DDD, 4,4'-	1.4E-08						NA					
22 DDE, 4,4'-	2.0E-08						NA					
23 DDT, 4,4'-	6.9E-08						1E-04					
24 Dibenz(a,h)ant	1.4E-07						4E-06					
25 Dieldrin	9.7E-09						2E-04					
26 Dimethylbenzen	0.0E+00						0E+00					
27 Endrin	3.7E-08						1E-04					
28 Fluoranthene	1.5E-06						4E-05					
29 Fluorene	0.0E+00						0E+00					
30 Gamma-chlordan	0.0E+00						0E+00					
31 Gamma-hexachlo	4.3E-09						1E-05					
32 Heptachlor	2.2E-09						4E-06					
33 Heptachlor epo	5.7E-09						4E-04					
34 Indeno(1,2,3-c	1.4E-06						4E-05					
35 Lead	1.4E-04						NA					
36 Mercury, inorg	1.7E-07						6E-04					
37 Naphthalene	4.7E-07						1E-05					
38 Nickel	4.8E-05						2E-03					
39 Nitrate	0.0E+00						0E+00					
40 Nitrite	0.0E+00						0E+00					
41 PCB 1260	6.7E-08						1E-03					
42 Phenanthrene	2.1E-06						5E-05					
43 Pyrene	1.9E-06						6E-05					
44 Silver	2.1E-06						4E-04					
45 Sulfide	5.2E-05						NA					
46 Tetrachloroeth	0.0E+00						0E+00					
47 Tetrazene	0.0E+00						NA					

48 Toluene	0.0E+00	0E+00					
49 Trichloroethen	0.0E+00	0E+00					
50 Uranium (solub	0.0E+00	0E+00					
51 Xylenes (total	0.0E+00	0E+00					
PATHWAY SUM (HI)		1E-02	0E+00	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL		1E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: RESDNT/WRKR
FILE NAME: POP10
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
COMM. WORKER 3

LIFETIME RISK SUMMARY

FUTURE
COMM. WORKER 3

		LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)						LIFETIME EXCESS CANCER RISK					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 3-NON	0	0	0	0	0	ZONE 3-NON	0	0	0	0	0
		SOIL (0-2')	0	0	0	0	0	SOIL (0-2')	0	0	0	0	0
		ORAL	0	0	0	0	0	ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	6.2E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	NA	0E+00	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00						NA					
3	Aldrin	6.6E-10						1E-08					
4	Alpha-chlordan	4.3E-09						6E-09					
5	Alpha-endosulf	9.8E-10						NA					
6	Anthracene	1.9E-07						NA					
7	Benzene	0.0E+00						0E+00					
8	Benzo(a)anthra	3.8E-07						3E-06					
9	Benzo(a)pyrene	4.4E-07						3E-06					
10	Benzo(b)fluora	5.0E-07						4E-06					
11	Benzo(g,h,i)pe	3.2E-07						NA					
12	Benzo(k)fluora	3.8E-07						3E-06					
13	Beta-endosulfa	2.2E-08						NA					
14	Boron	0.0E+00						NA					
15	Cadmium (food	4.7E-07						NA					
16	Cadmium (wate	0.0E+00						NA					
17	Chlordane	8.8E-08						1E-07					
18	Chromium (VI)	0.0E+00						NA					
19	Chrysene	4.0E-07						3E-06					
20	Cyanide (free)	0.0E+00						NA					
21	DDD, 4,4'-	5.0E-09						1E-09					
22	DDE, 4,4'-	6.9E-09						2E-09					
23	DDT, 4,4'-	2.4E-08						8E-09					
24	Dibenz(a,h)ant	5.0E-08						4E-07					
25	Dieldrin	3.4E-09						5E-08					
26	Dimethylbenzen	0.0E+00						NA					
27	Endrin	1.3E-08						NA					
28	Fluoranthene	5.2E-07						NA					
29	Fluorene	0.0E+00						NA					
30	Gamma-chlordan	0.0E+00						0E+00					
31	Gamma-hexachlo	1.5E-09						2E-09					
32	Heptachlor	7.7E-10						3E-09					
33	Heptachlor epo	2.0E-09						2E-08					
34	Indeno(1,2,3-c	4.9E-07						4E-06					
35	Lead	4.9E-05						NA					
36	Mercury, inorg	6.0E-08						NA					
37	Naphthalene	1.6E-07						NA					
38	Nickel	1.7E-05						NA					
39	Nitrate	0.0E+00						NA					
40	Nitrite	0.0E+00						NA					
41	PCB 1260	2.3E-08						2E-07					
42	Phenanthrene	7.3E-07						NA					
43	Pyrene	6.4E-07						NA					
44	Silver	7.2E-07						NA					
45	Sulfide	1.8E-05						NA					
46	Tetrachloroeth	0.0E+00						0E+00					
47	Tetrazene	0.0E+00						NA					

48 Toluene	0.0E+00		NA					
49 Trichloroethen	0.0E+00		0E+00					
50 Uranium (solub	0.0E+00		NA					
51 Xylenes (total	0.0E+00		NA					
		TOTAL PATHWAY CANCER RISK	2E-05	0E+00	0E+00	0E+00	0E+00	0E+00
		POPULATION TOTAL EXCESS RISK	2E-05					

RANGE NAME: POPSUM

EXPOSURE SCENARIOS EVALUATED
(GROUPED BY POPULATION)

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: DATA
LAST UPDATED: 08/18/93

POPULATION 1 — NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	WORKSHEET NAME
1	FUTURE	PARK VISITOR	RIVER PARK	SOIL-PARK	ORAL	7.3E-07	4.2E-07	6.4E-08	WS1
2			RIVER PARK	SOIL-PARK	DERMAL	9.3E-06	8.6E-06	2.3E-06	WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 2 — NO. OF SCENARIOS = 4

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	PARK SWIMMER	RIVER PARK	SURFACE WATER	ORAL	4.6E-05	2.9E-05	4.9E-06	WS1
2			RIVER PARK	SURFACE WATER	DERMAL	4.7E-03	4.1E-03	1.5E-03	WS2
3			RIVER PARK	SEDIMENT	ORAL	9.1E-08	5.7E-08	9.7E-09	WS3
4			RIVER PARK	SEDIMENT	DERMAL	2.3E-06	2.2E-06	5.6E-07	WS4
5									WS5
6									WS6

POPULATION 3 — NO. OF SCENARIOS = 1

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	PARK ANGLER	RIVER PARK	FISH	ORAL		1.9E-04	5.9E-05	WS1
2									WS2
3									WS3
4									WS4
5									WS5
6									WS6

POPULATION 4 — NO. OF SCENARIOS = 2

	LAND USE	EXPOSED POPULATION	EXPOSURE POINT	EXPOSURE MEDIUM	EXPOSURE ROUTE	HUMAN INTAKE FACTORS HIFs	HIFC	HIF1	RANGE NAME
1	FUTURE	ZONE 4 VISITOR	ZONE 4-NON EXC	SOIL (0-2')	ORAL	1.5E-06	8.5E-07	1.3E-07	WS1
2			ZONE 4-NON EXC	SOIL (0-2')	DERMAL	1.9E-05	1.7E-05	4.5E-06	WS2
3									WS3
4									WS4
5									WS5
6									WS6

RANGE NAME: CTV

LIST OF CHEMICALS OF CONCERN
WITH CTVs AND OTHER CHEMICAL-SPECIFIC DATA

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: DATA
LAST UPDATED: 08/18/93

		ORAL				INHALATION			DERMAL(a)				
NO.	CHEMICAL NAME	RfDs	RfDc	SF	AFo	RfDs	RfDc	SF	RfDs	RfDc	SF	ABS	P
1	Acenaphthene	6.00E-01	6.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.52E-01
2	Acenaphthylene	4.00E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.69E-01
3	Aldrin	3.0E-05	3.0E-05	1.7E+01	1.0E+00	NA	NA	1.7E+01	3.0E-05	3.0E-05	1.7E+01	1.0E-02	1.60E-03
4	Alpha-chlordan	6.0E-05	6.0E-05	1.3E+00	8E-01	NA	NA	1.3E+00	4.8E-05	4.8E-05	1.6E+00	1.0E-02	4.60E-02
5	Alpha-endosulf	2.0E-04	5.0E-05	NA	1.0E+00	NA	NA	NA	2.0E-04	5.0E-05	NA	1.0E-02	2.09E-03
6	Anthracene	3.0E+00	3.0E-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.26E-01
7	Benzene	5.0E-02	5.0E-03	2.9E-02	1.0E+00	9.1E-03	NA	2.9E-02	5.0E-02	5.0E-03	2.9E-02	8.0E-02	1.1E-01
8	Benzo(a)anthra	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	8.10E-01
9	Benzo(a)pyrene	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.20E+00
10	Benzo(b)fluora	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.20E+00
11	Benzo(g,h,i)pe	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.65E+00
12	Benzo(k)fluora	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.11E+00
13	Beta-endosulfa	2.0E-04	5.0E-05	NA	1.0E+00	NA	NA	NA	2.0E-04	5.0E-05	NA	1.0E-02	2.09E-03
14	Boron	9.0E-02	9.0E-02	NA	1E+00	5.7E-03	5.7E-03	NA	9.0E-02	9.0E-02	NA	1.0E-03	1.00E-03
15	Cadmium (food	NA	1.0E-03	NA	3E-02	NA	NA	6.1E+00	NA	2.5E-05	NA	1.0E-02	NA
16	Cadmium (wate	NA	5.0E-04	NA	5E-02	NA	NA	NA	NA	2.5E-05	NA	NA	1.00E-03
17	Chlordane	6.0E-05	6.0E-05	1.3E+00	1.0E+00	NA	NA	1.3E+00	6.0E-05	6.0E-05	1.3E+00	1.0E-02	5.20E-02
18	Chromium (VI)	2.0E-02	5.0E-03	NA	5E-02	NA	NA	4.2E+01	1.0E-03	2.5E-04	NA	NA	1.00E-03
19	Chrysene	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	8.10E-01
20	Cyanide (free)	2.0E-02	2.0E-02	NA	1E+00	2.9E-04	2.0E-03	NA	2.0E-02	2.0E-02	NA	3.0E-02	1.00E-03
21	DDD, 4,4'-	NA	NA	2.4E-01	1E+00	NA	NA	NA	NA	NA	2.4E-01	1.0E-02	2.80E-01
22	DDE, 4,4'-	NA	NA	3.4E-01	1E+00	NA	NA	NA	NA	NA	3.4E-01	1.0E-02	2.40E-01
23	DDT, 4,4'-	5.0E-04	5.0E-04	3.4E-01	1E+00	NA	NA	3.4E-01	5.0E-04	5.0E-04	3.4E-01	1.0E-02	4.30E-01
24	Dibenz(a,h)ant	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	2.70E+00
25	Dieldrin	5.0E-05	5.0E-05	1.6E+01	1E+00	NA	NA	1.6E+01	5.0E-05	5.0E-05	1.6E+01	1.0E-02	1.60E-02
26	Dimethylbenzen	4.0E+00	2.0E+00	NA	1E+00	NA	NA	NA	4.0E+00	2.0E+00	NA	1.2E-01	8.9E-02
27	Endrin	3.0E-04	3.0E-04	NA	1.0E+00	NA	NA	NA	3.0E-04	3.0E-04	NA	1.0E-02	1.60E-02
28	Fluoranthene	4.0E-01	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.60E-01
29	Fluorene	4.0E-01	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.58E-01
30	Gamma-chlordan	6.0E-05	6.0E-05	1.3E+00	8E-01	NA	NA	1.3E+00	4.8E-05	4.8E-05	1.6E+00	1.0E-02	5.20E-02
31	Gamma-hexachlo	3.0E-03	3.0E-04	1.3E+00	1E+00	NA	NA	NA	3.0E-03	3.0E-04	1.3E+00	1.0E-02	1.40E-01
32	Heptachlor	5.0E-04	5.0E-04	4.5E+00	1E+00	NA	NA	4.5E+00	5.0E-04	5.0E-04	4.5E+00	1.0E-02	1.10E-02
33	Heptachlor epo	1.3E-05	1.3E-05	9.1E+00	1E+00	NA	NA	9.1E+00	1.3E-05	1.3E-05	9.1E+00	1.0E-02	6.67E-04
34	Indeno(1,2,3-c	4.0E-02	4.0E-02	7.3E+00	NA	NA	NA	NA	NA	NA	NA	NA	1.90E+00
35	Lead	NA	NA	NA	2E-01	NA	NA	NA	NA	NA	NA	6.0E-03	1.00E-03
36	Mercury, inorg	3.0E-04	3.0E-04	NA	2E-02	NA	NA	NA	6.0E-06	6.0E-06	NA	1.0E-03	1.00E-03
37	Naphthalene	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.90E-02
38	Nickel	2.0E-02	2.0E-02	NA	5E-02	NA	NA	8.4E-01	1.0E-03	1.0E-03	NA	NA	NA
39	Nitrate	1.6E+00	1.6E+00	NA	1E+00	NA	NA	NA	1.6E+00	1.6E+00	NA	1.0E-03	1.00E-03
40	Nitrite	1.0E-01	1.0E-01	NA	1E+00	NA	NA	NA	1.0E-01	1.0E-01	NA	1.0E-03	1.00E-03
41	PCB 1260	7.0E-05	7.0E-05	7.7E+00	1E+00	NA	NA	NA	6.7E-05	6.7E-05	8.1E+00	6.0E-02	3.69E-01
42	Phenanthrene	4.0E-02	4.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.30E-01
43	Pyrene	3.0E-01	3.0E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.26E-01
44	Silver	5.0E-03	5.0E-03	NA	5E-02	NA	NA	NA	2.5E-04	2.5E-04	NA	1.0E-02	1.00E-03
45	Sulfide	NA	NA	NA	1E+00	NA	NA	NA	NA	NA	NA	1.0E-03	1.00E-03
46	Tetrachloroeth	1.0E-01	1.0E-02	5.2E-02	1.0E+00	NA	NA	2.0E-03	1.0E-01	1.0E-02	5.2E-02	1.0E-01	3.7E-01
47	Tetrazene	NA	NA	NA	1E+00	NA	NA	NA	NA	NA	NA	1.0E-02	
48	Toluene	2.0E+00	2.0E-01	NA	1.0E+00	5.7E-01	1.1E-01	NA	2.0E+00	2.0E-01	NA	1.2E-01	1.0E+00
49	Trichloroethen	2.0E-02	2.0E-03	1.1E-02	1.0E+00	NA	NA	6.0E-03	2.0E-02	2.0E-03	1.1E-02	1.0E-01	2.3E-01
50	Uranium (solub	NA	3.0E-03	NA	5.0E-02	NA	NA	NA	NA	1.5E-04	NA	1.00E-03	1.00E-03

51	Xylenes (total	4.0E+00	2.0E+00	NA	1E+00	NA	NA	NA	4.0E+00	2.0E+00	NA	1.2E-01	8.9E-02

RANGE NAME: EPC1

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: RIVER PARK

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL-PARK			MEDIUM 2 SURFACE WATER			MEDIUM 3 SEDIMENT			MEDIUM 4 FISH			MEDIUM 5 0		
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	11S	11C	11L	12S	12C	12L	13S	13C	13L	14S	14C	14L	15S	15C	15L
1	Acenaphthene	3.6E-01	3.6E-01	3.6E-01	0.0E+00	0.0E+00	0.0E+00	4.2E-01	4.2E-01	4.2E-01	0.0E+00	0.0E+00	0.0E+00			
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E+00	1.4E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00			
3	Aldrin	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-02	2.7E-02	2.7E-02	0.0E+00	0.0E+00	0.0E+00			
4	Alpha-chlordan	1.6E-02	1.6E-02	1.6E-02	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
5	Alpha-endosulf	2.5E-03	2.5E-03	2.5E-03	0.0E+00	0.0E+00	0.0E+00	1.4E-02	1.4E-02	1.4E-02	0.0E+00	0.0E+00	0.0E+00			
6	Anthracene	2.4E+00	2.4E+00	2.4E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
8	Benzo(a)anthra	4.1E+00	4.1E+00	4.1E+00	0.0E+00	0.0E+00	0.0E+00	5.2E+00	5.2E+00	5.2E+00	0.0E+00	0.0E+00	0.0E+00			
9	Benzo(a)pyrene	4.8E+00	4.8E+00	4.8E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
10	Benzo(b)fluora	2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	5.5E+00	5.5E+00	5.5E+00	0.0E+00	0.0E+00	0.0E+00			
11	Benzo(g,h,i)pe	2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+00	1.2E+00	1.2E+00	0.0E+00	0.0E+00	0.0E+00			
12	Benzo(k)fluora	3.7E+00	3.7E+00	3.7E+00	0.0E+00	0.0E+00	0.0E+00	6.1E+00	6.1E+00	6.1E+00	0.0E+00	0.0E+00	0.0E+00			
13	Beta-endosulfa	1.3E-02	1.3E-02	1.3E-02	0.0E+00	0.0E+00	0.0E+00	4.1E-03	4.1E-03	4.1E-03	0.0E+00	0.0E+00	0.0E+00			
14	Boron	0.0E+00	0.0E+00	0.0E+00	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
15	Cadmium (food	0.0E+00	0.0E+00	0.0E+00	--	--	--	1.1E+01	1.1E+01	1.1E+01	0.0E+00	0.0E+00	0.0E+00			
16	Cadmium (wate	--	--	--	0.0E+00	0.0E+00	0.0E+00	--	--	--	0.0E+00	0.0E+00	0.0E+00			
17	Chlordane	1.7E+00	1.7E+00	1.7E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E+02	1.3E+02	1.3E+02	1.5E-01	1.5E-01	1.5E-01			
19	Chrysene	4.2E+00	4.2E+00	4.2E+00	0.0E+00	0.0E+00	0.0E+00	6.0E+00	6.0E+00	6.0E+00	0.0E+00	0.0E+00	0.0E+00			
20	Cyanide (free)	4.3E-01	4.3E-01	4.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
21	DDD, 4,4'-	1.9E-01	1.9E-01	1.9E-01	0.0E+00	0.0E+00	0.0E+00	1.5E-01	1.5E-01	1.5E-01	0.0E+00	0.0E+00	0.0E+00			
22	DDE, 4,4'-	6.0E-01	6.0E-01	6.0E-01	0.0E+00	0.0E+00	0.0E+00	1.2E-01	1.2E-01	1.2E-01	0.0E+00	0.0E+00	0.0E+00			
23	DDT, 4,4'-	8.0E-01	8.0E-01	8.0E-01	0.0E+00	0.0E+00	0.0E+00	2.3E-01	2.3E-01	2.3E-01	0.0E+00	0.0E+00	0.0E+00			
24	Dibenz(a,h)ant	5.3E-01	5.3E-01	5.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
25	Dieldrin	2.0E-02	2.0E-02	2.0E-02	0.0E+00	0.0E+00	0.0E+00	1.5E-02	1.5E-02	1.5E-02	0.0E+00	0.0E+00	0.0E+00			
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00	1.8E-03	1.8E-03	1.8E-03	0.0E+00	0.0E+00	0.0E+00	1.8E-02	1.8E-02	1.8E-02			
27	Endrin	9.9E-02	9.9E-02	9.9E-02	0.0E+00	0.0E+00	0.0E+00	1.0E-02	1.0E-02	1.0E-02	0.0E+00	0.0E+00	0.0E+00			
28	Fluoranthene	6.9E+00	6.9E+00	6.9E+00	0.0E+00	0.0E+00	0.0E+00	8.2E+00	8.2E+00	8.2E+00	0.0E+00	0.0E+00	0.0E+00			
29	Fluorene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E+00	1.0E+00	1.0E+00	0.0E+00	0.0E+00	0.0E+00			
30	Gamma-chlordan	8.0E-03	8.0E-03	8.0E-03	--	--	--	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00	3.2E-06	3.2E-06	3.2E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
33	Heptachlor epo	6.7E-03	6.7E-03	6.7E-03	0.0E+00	0.0E+00	0.0E+00	7.0E-03	7.0E-03	7.0E-03	0.0E+00	0.0E+00	0.0E+00			
34	Indeno(1,2,3-c	2.7E+00	2.7E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	1.0E+01	1.0E+01	1.0E+01	0.0E+00	0.0E+00	0.0E+00			
35	Lead	1.7E+02	1.7E+02	1.7E+02	0.0E+00	0.0E+00	0.0E+00	6.3E+02	6.3E+02	6.3E+02	0.0E+00	0.0E+00	0.0E+00			
36	Mercury, inorg	3.7E-02	3.7E-02	3.7E-02	0.0E+00	0.0E+00	0.0E+00	8.1E-01	8.1E-01	8.1E-01	0.0E+00	0.0E+00	0.0E+00			
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
38	Nickel	2.3E+01	2.3E+01	2.3E+01	0.0E+00	0.0E+00	0.0E+00	4.0E+01	4.0E+01	4.0E+01	0.0E+00	0.0E+00	0.0E+00			
39	Nitrate	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
40	Nitrite	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
41	PCB 1260	6.0E-02	6.0E-02	6.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
42	Phenanthrene	4.3E+00	4.3E+00	4.3E+00	0.0E+00	0.0E+00	0.0E+00	6.1E+00	6.1E+00	6.1E+00	0.0E+00	0.0E+00	0.0E+00			
43	Pyrene	7.0E+00	7.0E+00	7.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E+01	1.0E+01	1.0E+01	0.0E+00	0.0E+00	0.0E+00			
44	Silver	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E+00	2.5E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00			
45	Sulfide	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00			
47	Tetrazene	--	--	--	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
48	Toluene	0.0E+00	0.0E+00	0.0E+00	2.8E-03	2.8E-03	2.8E-03	0.0E+00	0.0E+00	0.0E+00	1.5E-01	1.5E-01	1.5E-01			
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00	2.0E-03	2.0E-03	2.0E-03	0.0E+00	0.0E+00	0.0E+00	7.8E-02	7.8E-02	7.8E-02			
50	Uranium (solub	7.7E-02	7.7E-02	7.7E-02	--	--	--	--	--	--	0.0E+00	0.0E+00	0.0E+00			
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00	1.8E-03	1.8E-03	1.8E-03	0.0E+00	0.0E+00	0.0E+00	3.1E-02	3.1E-02	3.1E-02			

RANGE NAME: EPC2

EXPOSURE POINT CONCENTRATIONS

EXPOSURE POINT: ZONE 4-NON EXC

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: DATA
LAST UPDATED: 08/18/93

		MEDIUM 1 SOIL (0-2')			MEDIUM 2	0		MEDIUM 3	0		MEDIUM 4	0		MEDIUM 5	0	
		Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl	Cs	Cc	Cl
	CHEMICAL NAME	21S	21C	21L	22S	22C	22L	23S	23C	23L	24S	24C	24L	25S	25C	25L
1	Acenaphthene	7.2E-02	7.2E-02	7.2E-02												
2	Acenaphthylene	0.0E+00	0.0E+00	0.0E+00												
3	Aldrin	7.6E-03	7.6E-03	7.6E-03												
4	Alpha-chlordan	2.9E-02	2.9E-02	2.9E-02												
5	Alpha-endosulf	6.8E-03	6.8E-03	6.8E-03												
6	Anthracene	0.0E+00	0.0E+00	0.0E+00												
7	Benzene	0.0E+00	0.0E+00	0.0E+00												
8	Benzo(a)anthra	3.6E-01	3.6E-01	3.6E-01												
9	Benzo(a)pyrene	5.8E-01	5.8E-01	5.8E-01												
10	Benzo(b)fluora	5.8E-01	5.8E-01	5.8E-01												
11	Benzo(g,h,i)pe	4.4E-01	4.4E-01	4.4E-01												
12	Benzo(k)fluora	5.1E-01	5.1E-01	5.1E-01												
13	Beta-endosulfa	6.3E-03	6.3E-03	6.3E-03												
14	Boron	1.1E+01	1.1E+01	1.1E+01												
15	Cadmium (food	7.9E-01	7.9E-01	7.9E-01												
16	Cadmium (wate	--	--	--												
17	Chlordane	1.5E+00	1.5E+00	1.5E+00												
18	Chromium (VI)	0.0E+00	0.0E+00	0.0E+00												
19	Chrysene	6.9E-01	6.9E-01	6.9E-01												
20	Cyanide (free)	3.2E-01	3.2E-01	3.2E-01												
21	DDD, 4,4'-	1.9E-01	1.9E-01	1.9E-01												
22	DDE, 4,4'-	3.6E-01	3.6E-01	3.6E-01												
23	DDT, 4,4'-	9.4E-01	9.4E-01	9.4E-01												
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00												
25	Dieldrin	3.5E-02	3.5E-02	3.5E-02												
26	Dimethylbenzen	0.0E+00	0.0E+00	0.0E+00												
27	Endrin	3.8E-01	3.8E-01	3.8E-01												
28	Fluoranthene	6.4E-01	6.4E-01	6.4E-01												
29	Fluorene	0.0E+00	0.0E+00	0.0E+00												
30	Gamma-chlordan	3.2E-02	3.2E-02	3.2E-02												
31	Gamma-hexachlo	0.0E+00	0.0E+00	0.0E+00												
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00												
33	Heptachlor epo	8.8E-02	8.8E-02	8.8E-02												
34	Indeno(1,2,3-c	3.2E-01	3.2E-01	3.2E-01												
35	Lead	2.5E+02	2.5E+02	2.5E+02												
36	Mercury, inorg	2.4E-01	2.4E-01	2.4E-01												
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00												
38	Nickel	2.1E+01	2.1E+01	2.1E+01												
39	Nitrate	--	--	--												
40	Nitrite	5.7E+00	5.7E+00	5.7E+00												
41	PCB 1260	6.1E-01	6.1E-01	6.1E-01												
42	Phenanthrene	6.0E-01	6.0E-01	6.0E-01												
43	Pyrene	9.7E-01	9.7E-01	9.7E-01												
44	Silver	5.5E-02	5.5E-02	5.5E-02												
45	Sulfide	2.6E+02	2.6E+02	2.6E+02												
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00												
47	Tetrazene	--	--	--												
48	Toluene	0.0E+00	0.0E+00	0.0E+00												
49	Trichloroethen	0.0E+00	0.0E+00	0.0E+00												
50	Uranium (solub	0.0E+00	0.0E+00	0.0E+00												
51	Xylenes (total	0.0E+00	0.0E+00	0.0E+00												

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP1
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: PARK VISITOR

EXPOSURE POINT: RIVER PARK
MEDIUM: SOIL-PARK
ROUTE: ORAL

HIFs = 7.3E-07
HIFc = 4.2E-07
HIFl = 6.4E-08

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	3.6E-01	7.3E-07	1	2.6E-07	6.0E-01	4E-07	3.6E-01	4.2E-07	1	1.5E-07	6.0E-02	3E-06	3.6E-01	6.4E-08	1	2.3E-08	NA	NA
2	Acenaphthylene	0.0E+00	7.3E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	7.3E-07	1	0.0E+00	3.0E-05	0E+00	0.0E+00	4.2E-07	1	0.0E+00	3.0E-05	0E+00	0.0E+00	6.4E-08	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.6E-02	7.3E-07	1	1.1E-08	6.0E-05	2E-04	1.6E-02	4.2E-07	1	6.6E-09	6.0E-05	1E-04	1.6E-02	6.4E-08	1	1.0E-09	1.3E+00	1E-09
5	Alpha-endosulf	2.5E-03	7.3E-07	1	1.9E-09	2.0E-04	9E-06	2.5E-03	4.2E-07	1	1.1E-09	5.0E-05	2E-05	2.5E-03	6.4E-08	1	1.6E-10	NA	NA
6	Anthracene	2.4E+00	7.3E-07	1	1.7E-06	3.0E+00	6E-07	2.4E+00	4.2E-07	1	1.0E-06	3.0E-01	3E-06	2.4E+00	6.4E-08	1	1.5E-07	NA	NA
7	Benzene	0.0E+00	7.3E-07	1	0.0E+00	5.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	6.4E-08	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	4.1E+00	7.3E-07	1	3.0E-06	4.0E-02	7E-05	4.1E+00	4.2E-07	1	1.7E-06	4.0E-02	4E-05	4.1E+00	6.4E-08	1	2.6E-07	7.3E+00	2E-06
9	Benzo(a)pyrene	4.8E+00	7.3E-07	1	3.5E-06	4.0E-02	9E-05	4.8E+00	4.2E-07	1	2.0E-06	4.0E-02	5E-05	4.8E+00	6.4E-08	1	3.1E-07	7.3E+00	2E-06
10	Benzo(b)fluora	2.5E+00	7.3E-07	1	1.8E-06	4.0E-02	5E-05	2.5E+00	4.2E-07	1	1.0E-06	4.0E-02	3E-05	2.5E+00	6.4E-08	1	1.6E-07	7.3E+00	1E-06
11	Benzo(g,h,i)pe	2.5E+00	7.3E-07	1	1.8E-06	4.0E-02	5E-05	2.5E+00	4.2E-07	1	1.0E-06	4.0E-02	3E-05	2.5E+00	6.4E-08	1	1.6E-07	NA	NA
12	Benzo(k)fluora	3.7E+00	7.3E-07	1	2.7E-06	4.0E-02	7E-05	3.7E+00	4.2E-07	1	1.5E-06	4.0E-02	4E-05	3.7E+00	6.4E-08	1	2.4E-07	7.3E+00	2E-06
13	Beta-endosulfa	1.3E-02	7.3E-07	1	9.6E-09	2.0E-04	5E-05	1.3E-02	4.2E-07	1	5.5E-09	5.0E-05	1E-04	1.3E-02	6.4E-08	1	8.4E-10	NA	NA
14	Boron	0.0E+00	7.3E-07	1	0.0E+00	9.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	9.0E-02	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	7.3E-07	1	0.0E+00	NA	NA	0.0E+00	4.2E-07	1	0.0E+00	1.0E-03	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
16	Cadmium (wate	--	7.3E-07	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	5.0E-04	0E+00	--	6.4E-08	1	0.0E+00	NA	NA
17	Chlordane	1.7E+00	7.3E-07	1	1.2E-06	6.0E-05	2E-02	1.7E+00	4.2E-07	1	7.1E-07	6.0E-05	1E-02	1.7E+00	6.4E-08	1	1.1E-07	1.3E+00	1E-07
18	Chromium (VI)	0.0E+00	7.3E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
19	Chrysene	4.2E+00	7.3E-07	1	3.1E-06	4.0E-02	8E-05	4.2E+00	4.2E-07	1	1.8E-06	4.0E-02	4E-05	4.2E+00	6.4E-08	1	2.7E-07	7.3E+00	2E-06
20	Cyanide (free)	4.3E-01	7.3E-07	1	3.1E-07	2.0E-02	2E-05	4.3E-01	4.2E-07	1	1.8E-07	2.0E-02	9E-06	4.3E-01	6.4E-08	1	2.7E-08	NA	NA
21	DDD, 4,4'-	1.9E-01	7.3E-07	1	1.4E-07	NA	NA	1.9E-01	4.2E-07	1	8.1E-08	NA	NA	1.9E-01	6.4E-08	1	1.2E-08	2.4E-01	3E-09
22	DDE, 4,4'-	6.0E-01	7.3E-07	1	4.4E-07	NA	NA	6.0E-01	4.2E-07	1	2.5E-07	NA	NA	6.0E-01	6.4E-08	1	3.9E-08	3.4E-01	1E-08
23	DDT, 4,4'-	8.0E-01	7.3E-07	1	5.9E-07	5.0E-04	1E-03	8.0E-01	4.2E-07	1	3.4E-07	5.0E-04	7E-04	8.0E-01	6.4E-08	1	5.1E-08	3.4E-01	2E-08
24	Dibenz(a,h)ant	5.3E-01	7.3E-07	1	3.9E-07	4.0E-02	1E-05	5.3E-01	4.2E-07	1	2.2E-07	4.0E-02	6E-06	5.3E-01	6.4E-08	1	3.4E-08	7.3E+00	2E-07
25	Dieldrin	2.0E-02	7.3E-07	1	1.5E-08	5.0E-05	3E-04	2.0E-02	4.2E-07	1	8.4E-09	5.0E-05	2E-04	2.0E-02	6.4E-08	1	1.3E-09	1.6E+01	2E-08
26	Dimethylbenzen	0.0E+00	7.3E-07	1	0.0E+00	4.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
27	Endrin	9.9E-02	7.3E-07	1	7.2E-08	3.0E-04	2E-04	9.9E-02	4.2E-07	1	4.1E-08	3.0E-04	1E-04	9.9E-02	6.4E-08	1	6.3E-09	NA	NA
28	Fluoranthene	6.9E+00	7.3E-07	1	5.0E-06	4.0E-01	1E-05	6.9E+00	4.2E-07	1	2.9E-06	4.0E-02	7E-05	6.9E+00	6.4E-08	1	4.4E-07	NA	NA
29	Fluorene	0.0E+00	7.3E-07	1	0.0E+00	4.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
30	Gamma-chlordan	8.0E-03	7.3E-07	1	5.8E-09	6.0E-05	1E-04	8.0E-03	4.2E-07	1	3.4E-09	6.0E-05	6E-05	8.0E-03	6.4E-08	1	5.1E-10	1.3E+00	7E-10
31	Gamma-hexachlo	0.0E+00	7.3E-07	1	0.0E+00	3.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	3.0E-04	0E+00	0.0E+00	6.4E-08	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	7.3E-07	1	0.0E+00	5.0E-04	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.0E-04	0E+00	0.0E+00	6.4E-08	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	6.7E-03	7.3E-07	1	4.9E-09	1.3E-05	4E-04	6.7E-03	4.2E-07	1	2.8E-09	1.3E-05	2E-04	6.7E-03	6.4E-08	1	4.3E-10	9.1E+00	4E-09
34	Indeno(1,2,3-c	2.7E+00	7.3E-07	1	1.9E-06	4.0E-02	5E-05	2.7E+00	4.2E-07	1	1.1E-06	4.0E-02	3E-05	2.7E+00	6.4E-08	1	1.7E-07	7.3E+00	1E-06
35	Lead	1.7E+02	7.3E-07	1	1.2E-04	NA	NA	1.7E+02	4.2E-07	1	7.1E-05	NA	NA	1.7E+02	6.4E-08	1	1.1E-05	NA	NA
36	Mercury, inorg	3.7E-02	7.3E-07	1	2.7E-08	3.0E-04	9E-05	3.7E-02	4.2E-07	1	1.6E-08	3.0E-04	5E-05	3.7E-02	6.4E-08	1	2.4E-09	NA	NA
37	Naphthalene	0.0E+00	7.3E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
38	Nickel	2.3E+01	7.3E-07	1	1.7E-05	2.0E-02	9E-04	2.3E+01	4.2E-07	1	9.8E-06	2.0E-02	5E-04	2.3E+01	6.4E-08	1	1.5E-06	NA	NA
39	Nitrate	--	7.3E-07	1	0.0E+00	1.6E+00	0E+00	--	4.2E-07	1	0.0E+00	1.6E+00	0E+00	--	6.4E-08	1	0.0E+00	NA	NA
40	Nitrite	--	7.3E-07	1	0.0E+00	1.0E-01	0E+00	--	4.2E-07	1	0.0E+00	1.0E-01	0E+00	--	6.4E-08	1	0.0E+00	NA	NA
41	PCB 1260	6.0E-02	7.3E-07	1	4.4E-08	7.0E-05	6E-04	6.0E-02	4.2E-07	1	2.5E-08	7.0E-05	4E-04	6.0E-02	6.4E-08	1	3.9E-09	7.7E+00	3E-08
42	Phenanthrene	4.3E+00	7.3E-07	1	3.2E-06	4.0E-02	8E-05	4.3E+00	4.2E-07	1	1.8E-06	4.0E-02	5E-05	4.3E+00	6.4E-08	1	2.8E-07	NA	NA
43	Pyrene	7.0E+00	7.3E-07	1	5.1E-06	3.0E-01	2E-05	7.0E+00	4.2E-07	1	2.9E-06	3.0E-02	1E-04	7.0E+00	6.4E-08	1	4.5E-07	NA	NA
44	Silver	0.0E+00	7.3E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.2E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA

45 Sulfide	--	7.3E-07	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA	--	6.4E-08	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	7.3E-07	1	0.0E+00	1.0E-01	0E+00	0.0E+00	4.2E-07	1	0.0E+00	1.0E-02	0E+00	0.0E+00	6.4E-08	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	7.3E-07	1	0.0E+00	NA	NA	--	4.2E-07	1	0.0E+00	NA	NA	--	6.4E-08	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	7.3E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.0E-01	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	7.3E-07	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.0E-03	0E+00	0.0E+00	6.4E-08	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	7.7E-02	7.3E-07	1	5.6E-08	NA	NA	7.7E-02	4.2E-07	1	3.2E-08	3.0E-03	1E-05	7.7E-02	6.4E-08	1	4.9E-09	NA	NA
51 Xylenes (total	0.0E+00	7.3E-07	1	0.0E+00	4.0E+00	0E+00	0.0E+00	4.2E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	6.4E-08	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP1
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: PARK VISITOR

EXPOSURE POINT: RIVER PARK
MEDIUM: SOIL-PARK
ROUTE: DERMAL

HIFs = 9.3E-06
HIFc = 8.6E-06
HIFl = 2.3E-06

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	3.6E-01	9.3E-06	NA	NA	NA	NA	3.6E-01	8.6E-06	NA	NA	NA	NA	3.6E-01	2.3E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	9.3E-06	NA	NA	NA	NA	0.0E+00	8.6E-06	NA	NA	NA	NA	0.0E+00	2.3E-06	NA	NA	NA	NA
3	Aldrin	0.0E+00	9.3E-06	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	8.6E-06	1.0E-02	0.0E+00	3.0E-05	0E+00	0.0E+00	2.3E-06	1.0E-02	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	1.6E-02	9.3E-06	1.0E-02	1.5E-09	4.8E-05	3E-05	1.6E-02	8.6E-06	1.0E-02	1.3E-09	4.8E-05	3E-05	1.6E-02	2.3E-06	1.0E-02	3.6E-10	1.6E+00	6E-10
5	Alpha-endosulf	2.5E-03	9.3E-06	1.0E-02	2.4E-10	2.0E-04	1E-06	2.5E-03	8.6E-06	1.0E-02	2.2E-10	5.0E-05	4E-06	2.5E-03	2.3E-06	1.0E-02	5.8E-11	NA	NA
6	Anthracene	2.4E+00	9.3E-06	NA	NA	NA	NA	2.4E+00	8.6E-06	NA	NA	NA	NA	2.4E+00	2.3E-06	NA	NA	NA	NA
7	Benzene	0.0E+00	9.3E-06	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	8.6E-06	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	2.3E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	4.1E+00	9.3E-06	NA	NA	NA	NA	4.1E+00	8.6E-06	NA	NA	NA	NA	4.1E+00	2.3E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	4.8E+00	9.3E-06	NA	NA	NA	NA	4.8E+00	8.6E-06	NA	NA	NA	NA	4.8E+00	2.3E-06	NA	NA	NA	NA
10	Benzo(b)fluora	2.5E+00	9.3E-06	NA	NA	NA	NA	2.5E+00	8.6E-06	NA	NA	NA	NA	2.5E+00	2.3E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	2.5E+00	9.3E-06	NA	NA	NA	NA	2.5E+00	8.6E-06	NA	NA	NA	NA	2.5E+00	2.3E-06	NA	NA	NA	NA
12	Benzo(k)fluora	3.7E+00	9.3E-06	NA	NA	NA	NA	3.7E+00	8.6E-06	NA	NA	NA	NA	3.7E+00	2.3E-06	NA	NA	NA	NA
13	Beta-endosulfa	1.3E-02	9.3E-06	1.0E-02	1.2E-09	2.0E-04	6E-06	1.3E-02	8.6E-06	1.0E-02	1.1E-09	5.0E-05	2E-05	1.3E-02	2.3E-06	1.0E-02	3.0E-10	NA	NA
14	Boron	0.0E+00	9.3E-06	1.0E-03	0.0E+00	9.0E-02	0E+00	0.0E+00	8.6E-06	1.0E-03	0.0E+00	9.0E-02	0E+00	0.0E+00	2.3E-06	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	0.0E+00	9.3E-06	1.0E-02	0.0E+00	NA	NA	0.0E+00	8.6E-06	1.0E-02	0.0E+00	2.5E-05	0E+00	0.0E+00	2.3E-06	1.0E-02	0.0E+00	NA	NA
16	Cadmium (wate	--	9.3E-06	NA	NA	NA	NA	--	8.6E-06	NA	NA	2.5E-05	NA	--	2.3E-06	NA	NA	NA	NA
17	Chlordane	1.7E+00	9.3E-06	1.0E-02	1.6E-07	6.0E-05	3E-03	1.7E+00	8.6E-06	1.0E-02	1.5E-07	6.0E-05	2E-03	1.7E+00	2.3E-06	1.0E-02	3.9E-08	1.3E+00	5E-08
18	Chromium (VI)	0.0E+00	9.3E-06	NA	NA	1.0E-03	NA	0.0E+00	8.6E-06	NA	NA	2.5E-04	NA	0.0E+00	2.3E-06	NA	NA	NA	NA
19	Chrysene	4.2E+00	9.3E-06	NA	NA	NA	NA	4.2E+00	8.6E-06	NA	NA	NA	NA	4.2E+00	2.3E-06	NA	NA	NA	NA
20	Cyanide (free)	4.3E-01	9.3E-06	3.0E-02	1.2E-07	2.0E-02	6E-06	4.3E-01	8.6E-06	3.0E-02	1.1E-07	2.0E-02	6E-06	4.3E-01	2.3E-06	3.0E-02	3.0E-08	NA	NA
21	DDD, 4,4'-	1.9E-01	9.3E-06	1.0E-02	1.8E-08	NA	NA	1.9E-01	8.6E-06	1.0E-02	1.7E-08	NA	NA	1.9E-01	2.3E-06	1.0E-02	4.5E-09	2.4E-01	1E-09
22	DDE, 4,4'-	6.0E-01	9.3E-06	1.0E-02	5.6E-08	NA	NA	6.0E-01	8.6E-06	1.0E-02	5.2E-08	NA	NA	6.0E-01	2.3E-06	1.0E-02	1.4E-08	3.4E-01	5E-09
23	DDT, 4,4'-	8.0E-01	9.3E-06	1.0E-02	7.5E-08	5.0E-04	1E-04	8.0E-01	8.6E-06	1.0E-02	6.9E-08	5.0E-04	1E-04	8.0E-01	2.3E-06	1.0E-02	1.8E-08	3.4E-01	6E-09
24	Dibenz(a,h)ant	5.3E-01	9.3E-06	NA	NA	NA	NA	5.3E-01	8.6E-06	NA	NA	NA	NA	5.3E-01	2.3E-06	NA	NA	NA	NA
25	Dieldrin	2.0E-02	9.3E-06	1.0E-02	1.9E-09	5.0E-05	4E-05	2.0E-02	8.6E-06	1.0E-02	1.7E-09	5.0E-05	3E-05	2.0E-02	2.3E-06	1.0E-02	4.6E-10	1.6E+01	7E-09
26	Dimethylbenzen	0.0E+00	9.3E-06	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	8.6E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	2.3E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	9.9E-02	9.3E-06	1.0E-02	9.2E-09	3.0E-04	3E-05	9.9E-02	8.6E-06	1.0E-02	8.5E-09	3.0E-04	3E-05	9.9E-02	2.3E-06	1.0E-02	2.3E-09	NA	NA
28	Fluoranthene	6.9E+00	9.3E-06	NA	NA	NA	NA	6.9E+00	8.6E-06	NA	NA	NA	NA	6.9E+00	2.3E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	9.3E-06	NA	NA	NA	NA	0.0E+00	8.6E-06	NA	NA	NA	NA	0.0E+00	2.3E-06	NA	NA	NA	NA
30	Gamma-chlordan	8.0E-03	9.3E-06	1.0E-02	7.4E-10	4.8E-05	2E-05	8.0E-03	8.6E-06	1.0E-02	6.9E-10	4.8E-05	1E-05	8.0E-03	2.3E-06	1.0E-02	1.8E-10	1.6E+00	3E-10
31	Gamma-hexachlo	0.0E+00	9.3E-06	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	8.6E-06	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	2.3E-06	1.0E-02	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	9.3E-06	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	8.6E-06	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	2.3E-06	1.0E-02	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	6.7E-03	9.3E-06	1.0E-02	6.2E-10	1.3E-05	5E-05	6.7E-03	8.6E-06	1.0E-02	5.8E-10	1.3E-05	4E-05	6.7E-03	2.3E-06	1.0E-02	1.5E-10	9.1E+00	1E-09
34	Indeno(1,2,3-c	2.7E+00	9.3E-06	NA	NA	NA	NA	2.7E+00	8.6E-06	NA	NA	NA	NA	2.7E+00	2.3E-06	NA	NA	NA	NA
35	Lead	1.7E+02	9.3E-06	6.0E-03	9.5E-06	NA	NA	1.7E+02	8.6E-06	6.0E-03	8.7E-06	NA	NA	1.7E+02	2.3E-06	6.0E-03	2.3E-06	NA	NA
36	Mercury, inorg	3.7E-02	9.3E-06	1.0E-03	3.5E-10	6.0E-06	6E-05	3.7E-02	8.6E-06	1.0E-03	3.2E-10	6.0E-06	5E-05	3.7E-02	2.3E-06	1.0E-03	8.6E-11	NA	NA
37	Naphthalene	0.0E+00	9.3E-06	NA	NA	NA	NA	0.0E+00	8.6E-06	NA	NA	NA	NA	0.0E+00	2.3E-06	NA	NA	NA	NA
38	Nickel	2.3E+01	9.3E-06	NA	NA	1.0E-03	NA	2.3E+01	8.6E-06	NA	NA	1.0E-03	NA	2.3E+01	2.3E-06	NA	NA	NA	NA
39	Nitrate	--	9.3E-06	1.0E-03	0.0E+00	1.6E+00	0E+00	--	8.6E-06	1.0E-03	0.0E+00	1.6E+00	0E+00	--	2.3E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	--	9.3E-06	1.0E-03	0.0E+00	1.0E-01	0E+00	--	8.6E-06	1.0E-03	0.0E+00	1.0E-01	0E+00	--	2.3E-06	1.0E-03	0.0E+00	NA	NA
41	PCB 1260	6.0E-02	9.3E-06	6.0E-02	3.4E-08	6.7E-05	5E-04	6.0E-02	8.6E-06	6.0E-02	3.1E-08	6.7E-05	5E-04	6.0E-02	2.3E-06	6.0E-02	8.3E-09	8.1E+00	7E-08
42	Phenanthrene	4.3E+00	9.3E-06	NA	NA	NA	NA	4.3E+00	8.6E-06	NA	NA	NA	NA	4.3E+00	2.3E-06	NA	NA	NA	NA
43	Pyrene	7.0E+00	9.3E-06	NA	NA	NA	NA	7.0E+00	8.6E-06	NA	NA	NA	NA	7.0E+00	2.3E-06	NA	NA	NA	NA
44	Silver	0.0E+00	9.3E-06	1.0E-02	0.0E+00	2.5E-04	0E+00	0.0E+00	8.6E-06	1.0E-02	0.0E+00	2.5E-04	0E+00	0.0E+00	2.3E-06	1.0E-02	0.0E+00	NA	NA

45	Sulfide	--	9.3E-06	1.0E-03	0.0E+00	NA	NA	--	8.6E-06	1.0E-03	0.0E+00	NA	NA	--	2.3E-06	1.0E-03	0.0E+00	NA	NA
46	Tetrachloroeth	0.0E+00	9.3E-06	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	8.6E-06	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	2.3E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47	Tetrazene	--	9.3E-06	1.0E-02	0.0E+00	NA	NA	--	8.6E-06	1.0E-02	0.0E+00	NA	NA	--	2.3E-06	1.0E-02	0.0E+00	NA	NA
48	Toluene	0.0E+00	9.3E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	8.6E-06	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	2.3E-06	1.2E-01	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	9.3E-06	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	8.6E-06	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	2.3E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	7.7E-02	9.3E-06	1.0E-03	7.1E-10	NA	NA	7.7E-02	8.6E-06	1.0E-03	6.6E-10	1.5E-04	4E-06	7.7E-02	2.3E-06	1.0E-03	1.8E-10	NA	NA
51	Xylenes (total	0.0E+00	9.3E-06	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	8.6E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	2.3E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP1
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
PARK VISITOR

SUBCHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SOIL-PARK ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SOIL-PARK DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	2.6E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	0.0E+00	0.0E+00				
4	Alpha-chlordan	1.1E-08	1.5E-09				
5	Alpha-endosulf	1.9E-09	2.4E-10				
6	Anthracene	1.7E-06	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	3.0E-06	NA				
9	Benzo(a)pyrene	3.5E-06	NA				
10	Benzo(b)fluora	1.8E-06	NA				
11	Benzo(g,h,i)pe	1.8E-06	NA				
12	Benzo(k)fluora	2.7E-06	NA				
13	Beta-endosulfa	9.6E-09	1.2E-09				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	0.0E+00	0.0E+00				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	1.2E-06	1.6E-07				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	3.1E-06	NA				
20	Cyanide (free)	3.1E-07	1.2E-07				
21	DDD, 4,4'-	1.4E-07	1.8E-08				
22	DDE, 4,4'-	4.4E-07	5.6E-08				
23	DDT, 4,4'-	5.9E-07	7.5E-08				
24	Dibenz(a,h)ant	3.9E-07	NA				
25	Dieldrin	1.5E-08	1.9E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	7.2E-08	9.2E-09				
28	Fluoranthene	5.0E-06	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	5.8E-09	7.4E-10				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	4.9E-09	6.2E-10				
34	Indeno(1,2,3-c	1.9E-06	NA				
35	Lead	1.2E-04	9.5E-06				
36	Mercury, inorg	2.7E-08	3.5E-10				
37	Naphthalene	0.0E+00	NA				
38	Nickel	1.7E-05	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	4.4E-08	3.4E-08				
42	Phenanthrene	3.2E-06	NA				
43	Pyrene	5.1E-06	NA				
44	Silver	0.0E+00	0.0E+00				
45	Sulfide	0.0E+00	0.0E+00				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

SUBCHRONIC RISK SUMMARY

FUTURE
PARK VISITOR

SUBCHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SOIL-PARK ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SOIL-PARK DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	4E-07	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	0E+00	0E+00				
4	Alpha-chlordan	2E-04	3E-05				
5	Alpha-endosulf	9E-06	1E-06				
6	Anthracene	6E-07	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	7E-05	NA				
9	Benzo(a)pyrene	9E-05	NA				
10	Benzo(b)fluora	5E-05	NA				
11	Benzo(g,h,i)pe	5E-05	NA				
12	Benzo(k)fluora	7E-05	NA				
13	Beta-endosulfa	5E-05	6E-06				
14	Boron	0E+00	0E+00				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	2E-02	3E-03				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	8E-05	NA				
20	Cyanide (free)	2E-05	6E-06				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	1E-03	1E-04				
24	Dibenz(a,h)ant	1E-05	NA				
25	Dieldrin	3E-04	4E-05				
26	Dimethylbenzen	0E+00	0E+00				
27	Endrin	2E-04	3E-05				
28	Fluoranthene	1E-05	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	1E-04	2E-05				
31	Gamma-hexachlo	0E+00	0E+00				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	4E-04	5E-05				
34	Indeno(1,2,3-c	5E-05	NA				
35	Lead	NA	NA				
36	Mercury, inorg	9E-05	6E-05				
37	Naphthalene	0E+00	NA				
38	Nickel	9E-04	NA				
39	Nitrate	0E+00	0E+00				
40	Nitrite	0E+00	0E+00				
41	PCB 1260	6E-04	5E-04				
42	Phenanthrene	8E-05	NA				
43	Pyrene	2E-05	NA				
44	Silver	0E+00	0E+00				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00		0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00		0E+00	0E+00			
50 Uranium (solub	5.6E-08	7.1E-10		NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00		0E+00	0E+00			
			PATHWAY SUM (HI)	2E-02	4E-03	0E+00	0E+00	0E+00	0E+00
			POPULATION TOTAL	2E-02					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP1
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
PARK VISITOR

	CHRONIC DAILY INTAKE (mg/kg/day)					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	RIVER PARK	RIVER PARK	0	0	0	0
	SOIL-PARK	SOIL-PARK	0	0	0	0
	ORAL	DERMAL	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	1.5E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2 Acenaphthylene	0.0E+00	NA				
3 Aldrin	0.0E+00	0.0E+00				
4 Alpha-chlordan	6.6E-09	1.3E-09				
5 Alpha-endosulf	1.1E-09	2.2E-10				
6 Anthracene	1.0E-06	NA				
7 Benzene	0.0E+00	0.0E+00				
8 Benzo(a)anthra	1.7E-06	NA				
9 Benzo(a)pyrene	2.0E-06	NA				
10 Benzo(b)fluora	1.0E-06	NA				
11 Benzo(g,h,i)pe	1.0E-06	NA				
12 Benzo(k)fluora	1.5E-06	NA				
13 Beta-endosulfa	5.5E-09	1.1E-09				
14 Boron	0.0E+00	0.0E+00				
15 Cadmium (food	0.0E+00	0.0E+00				
16 Cadmium (wate	0.0E+00	NA				
17 Chlordane	7.1E-07	1.5E-07				
18 Chromium (VI)	0.0E+00	NA				
19 Chrysene	1.8E-06	NA				
20 Cyanide (free)	1.8E-07	1.1E-07				
21 DDD, 4,4'-	8.1E-08	1.7E-08				
22 DDE, 4,4'-	2.5E-07	5.2E-08				
23 DDT, 4,4'-	3.4E-07	6.9E-08				
24 Dibenz(a,h)ant	2.2E-07	NA				
25 Dieldrin	8.4E-09	1.7E-09				
26 Dimethylbenzen	0.0E+00	0.0E+00				
27 Endrin	4.1E-08	8.5E-09				
28 Fluoranthene	2.9E-06	NA				
29 Fluorene	0.0E+00	NA				
30 Gamma-chlordan	3.4E-09	6.9E-10				
31 Gamma-hexachlo	0.0E+00	0.0E+00				
32 Heptachlor	0.0E+00	0.0E+00				
33 Heptachlor epo	2.8E-09	5.8E-10				
34 Indeno(1,2,3-c	1.1E-06	NA				
35 Lead	7.1E-05	8.7E-06				
36 Mercury, inorg	1.6E-08	3.2E-10				
37 Naphthalene	0.0E+00	NA				
38 Nickel	9.8E-06	NA				
39 Nitrate	0.0E+00	0.0E+00				
40 Nitrite	0.0E+00	0.0E+00				
41 PCB 1260	2.5E-08	3.1E-08				
42 Phenanthrene	1.8E-06	NA				
43 Pyrene	2.9E-06	NA				
44 Silver	0.0E+00	0.0E+00				
45 Sulfide	0.0E+00	0.0E+00				
46 Tetrachloroeth	0.0E+00	0.0E+00				
47 Tetrazene	0.0E+00	0.0E+00				

CHRONIC RISK SUMMARY

FUTURE
PARK VISITOR

	CHRONIC HAZARD QUOTIENT					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	RIVER PARK	RIVER PARK	0	0	0	0
	SOIL-PARK	SOIL-PARK	0	0	0	0
	ORAL	DERMAL	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	3E-06	NA	0E+00	0E+00	0E+00	0E+00
2 Acenaphthylene	0E+00	NA				
3 Aldrin	0E+00	0E+00				
4 Alpha-chlordan	1E-04	3E-05				
5 Alpha-endosulf	2E-05	4E-06				
6 Anthracene	3E-06	NA				
7 Benzene	0E+00	0E+00				
8 Benzo(a)anthra	4E-05	NA				
9 Benzo(a)pyrene	5E-05	NA				
10 Benzo(b)fluora	3E-05	NA				
11 Benzo(g,h,i)pe	3E-05	NA				
12 Benzo(k)fluora	4E-05	NA				
13 Beta-endosulfa	1E-04	2E-05				
14 Boron	0E+00	0E+00				
15 Cadmium (food	0E+00	0E+00				
16 Cadmium (wate	0E+00	NA				
17 Chlordane	1E-02	2E-03				
18 Chromium (VI)	0E+00	NA				
19 Chrysene	4E-05	NA				
20 Cyanide (free)	9E-06	6E-06				
21 DDD, 4,4'-	NA	NA				
22 DDE, 4,4'-	NA	NA				
23 DDT, 4,4'-	7E-04	1E-04				
24 Dibenz(a,h)ant	6E-06	NA				
25 Dieldrin	2E-04	3E-05				
26 Dimethylbenzen	0E+00	0E+00				
27 Endrin	1E-04	3E-05				
28 Fluoranthene	7E-05	NA				
29 Fluorene	0E+00	NA				
30 Gamma-chlordan	6E-05	1E-05				
31 Gamma-hexachlo	0E+00	0E+00				
32 Heptachlor	0E+00	0E+00				
33 Heptachlor epo	2E-04	4E-05				
34 Indeno(1,2,3-c	3E-05	NA				
35 Lead	NA	NA				
36 Mercury, inorg	5E-05	5E-05				
37 Naphthalene	0E+00	NA				
38 Nickel	5E-04	NA				
39 Nitrate	0E+00	0E+00				
40 Nitrite	0E+00	0E+00				
41 PCB 1260	4E-04	5E-04				
42 Phenanthrene	5E-05	NA				
43 Pyrene	1E-04	NA				
44 Silver	0E+00	0E+00				
45 Sulfide	NA	NA				
46 Tetrachloroeth	0E+00	0E+00				
47 Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	3.2E-08	6.6E-10	1E-05	4E-06				
51 Xylenes (total	0.0E+00	0.0E+00	0E+00	0E+00				
PATHWAY SUM (HI)			1E-02	3E-03	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL			1E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP1
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
PARK VISITOR

	CHEMICAL NAME	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)					
		SCENARIO 1 RIVER PARK SOIL-PARK ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SOIL-PARK DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	2.3E-08	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	0.0E+00	0.0E+00				
4	Alpha-chlordan	1.0E-09	3.6E-10				
5	Alpha-endosulf	1.6E-10	5.8E-11				
6	Anthracene	1.5E-07	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	2.6E-07	NA				
9	Benzo(a)pyrene	3.1E-07	NA				
10	Benzo(b)fluora	1.6E-07	NA				
11	Benzo(g,h,i)pe	1.6E-07	NA				
12	Benzo(k)fluora	2.4E-07	NA				
13	Beta-endosulfa	8.4E-10	3.0E-10				
14	Boron	0.0E+00	0.0E+00				
15	Cadmium (food	0.0E+00	0.0E+00				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	1.1E-07	3.9E-08				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	2.7E-07	NA				
20	Cyanide (free)	2.7E-08	3.0E-08				
21	DDD, 4,4'-	1.2E-08	4.5E-09				
22	DDE, 4,4'-	3.9E-08	1.4E-08				
23	DDT, 4,4'-	5.1E-08	1.8E-08				
24	Dibenz(a,h)ant	3.4E-08	NA				
25	Dieldrin	1.3E-09	4.6E-10				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	6.3E-09	2.3E-09				
28	Fluoranthene	4.4E-07	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	5.1E-10	1.8E-10				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	4.3E-10	1.5E-10				
34	Indeno(1,2,3-c	1.7E-07	NA				
35	Lead	1.1E-05	2.3E-06				
36	Mercury, inorg	2.4E-09	8.6E-11				
37	Naphthalene	0.0E+00	NA				
38	Nickel	1.5E-06	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	0.0E+00	0.0E+00				
41	PCB 1260	3.9E-09	8.3E-09				
42	Phenanthrene	2.8E-07	NA				
43	Pyrene	4.5E-07	NA				
44	Silver	0.0E+00	0.0E+00				
45	Sulfide	0.0E+00	0.0E+00				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

LIFETIME RISK SUMMARY

FUTURE
PARK VISITOR

	CHEMICAL NAME	LIFETIME EXCESS CANCER RISK					
		SCENARIO 1 RIVER PARK SOIL-PARK ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SOIL-PARK DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	0E+00	0E+00				
4	Alpha-chlordan	1E-09	6E-10				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	2E-06	NA				
9	Benzo(a)pyrene	2E-06	NA				
10	Benzo(b)fluora	1E-06	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	2E-06	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	1E-07	5E-08				
18	Chromium (VI)	NA	NA				
19	Chrysene	2E-06	NA				
20	Cyanide (free)	NA	NA				
21	DDD, 4,4'-	3E-09	1E-09				
22	DDE, 4,4'-	1E-08	5E-09				
23	DDT, 4,4'-	2E-08	6E-09				
24	Dibenz(a,h)ant	2E-07	NA				
25	Dieldrin	2E-08	7E-09				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	7E-10	3E-10				
31	Gamma-hexachlo	0E+00	0E+00				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	4E-09	1E-09				
34	Indeno(1,2,3-c	1E-06	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	NA				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	3E-08	7E-08				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	4.9E-09	1.8E-10	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			1E-05	1E-07	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			1E-05					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: PARK SWIMMER

EXPOSURE POINT: RIVER PARK
MEDIUM: SURFACE WATER
ROUTE: ORAL

HIFs = 4.6E-05
HIFc = 2.9E-05
HIFl = 4.9E-06

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	0.0E+00	4.6E-05	1	0.0E+00	6.0E-01	0E+00	0.0E+00	2.9E-05	1	0.0E+00	6.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
3	Aldrin	0.0E+00	4.6E-05	1	0.0E+00	3.0E-05	0E+00	0.0E+00	2.9E-05	1	0.0E+00	3.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	--	4.6E-05	1	0.0E+00	6.0E-05	0E+00	--	2.9E-05	1	0.0E+00	6.0E-05	0E+00	--	4.9E-06	1	0.0E+00	1.3E+00	0E+00
5	Alpha-endosulf	0.0E+00	4.6E-05	1	0.0E+00	2.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
6	Anthracene	0.0E+00	4.6E-05	1	0.0E+00	3.0E+00	0E+00	0.0E+00	2.9E-05	1	0.0E+00	3.0E-01	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	4.6E-05	1	0.0E+00	5.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.9E-06	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
9	Benzo(a)pyrene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
11	Benzo(g,h,i)pe	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
12	Benzo(k)fluora	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
13	Beta-endosulfa	0.0E+00	4.6E-05	1	0.0E+00	2.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
14	Boron	--	4.6E-05	1	0.0E+00	9.0E-02	0E+00	--	2.9E-05	1	0.0E+00	9.0E-02	0E+00	--	4.9E-06	1	0.0E+00	NA	NA
15	Cadmium (food	--	4.6E-05	1	0.0E+00	NA	NA	--	2.9E-05	1	0.0E+00	1.0E-03	0E+00	--	4.9E-06	1	0.0E+00	NA	NA
16	Cadmium (wate	0.0E+00	4.6E-05	1	0.0E+00	NA	NA	0.0E+00	2.9E-05	1	0.0E+00	5.0E-04	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
17	Chlordane	0.0E+00	4.6E-05	1	0.0E+00	6.0E-05	0E+00	0.0E+00	2.9E-05	1	0.0E+00	6.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	1.3E+00	0E+00
18	Chromium (VI)	0.0E+00	4.6E-05	1	0.0E+00	2.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
19	Chrysene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
20	Cyanide (free)	0.0E+00	4.6E-05	1	0.0E+00	2.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
21	DDD, 4,4'-	0.0E+00	4.6E-05	1	0.0E+00	NA	NA	0.0E+00	2.9E-05	1	0.0E+00	NA	NA	0.0E+00	4.9E-06	1	0.0E+00	2.4E-01	0E+00
22	DDE, 4,4'-	0.0E+00	4.6E-05	1	0.0E+00	NA	NA	0.0E+00	2.9E-05	1	0.0E+00	NA	NA	0.0E+00	4.9E-06	1	0.0E+00	3.4E-01	0E+00
23	DDT, 4,4'-	0.0E+00	4.6E-05	1	0.0E+00	5.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-04	0E+00	0.0E+00	4.9E-06	1	0.0E+00	3.4E-01	0E+00
24	Dibenz(a,h)ant	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	0.0E+00	4.6E-05	1	0.0E+00	5.0E-05	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	1.6E+01	0E+00
26	Dimethylbenzen	1.8E-03	4.6E-05	1	8.5E-08	4.0E+00	2E-08	1.8E-03	2.9E-05	1	5.3E-08	2.0E+00	3E-08	1.8E-03	4.9E-06	1	9.0E-09	NA	NA
27	Endrin	0.0E+00	4.6E-05	1	0.0E+00	3.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	3.0E-04	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
28	Fluoranthene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-01	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
29	Fluorene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-01	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
30	Gamma-chlordan	--	4.6E-05	1	0.0E+00	6.0E-05	0E+00	--	2.9E-05	1	0.0E+00	6.0E-05	0E+00	--	4.9E-06	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	3.2E-06	4.6E-05	1	1.5E-10	3.0E-03	5E-08	3.2E-06	2.9E-05	1	9.3E-11	3.0E-04	3E-07	3.2E-06	4.9E-06	1	1.6E-11	1.3E+00	2E-11
32	Heptachlor	0.0E+00	4.6E-05	1	0.0E+00	5.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-04	0E+00	0.0E+00	4.9E-06	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	0.0E+00	4.6E-05	1	0.0E+00	1.3E-05	0E+00	0.0E+00	2.9E-05	1	0.0E+00	1.3E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	9.1E+00	0E+00
34	Indeno(1,2,3-c	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.3E+00	0E+00
35	Lead	0.0E+00	4.6E-05	1	0.0E+00	NA	NA	0.0E+00	2.9E-05	1	0.0E+00	NA	NA	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
36	Mercury, inorg	0.0E+00	4.6E-05	1	0.0E+00	3.0E-04	0E+00	0.0E+00	2.9E-05	1	0.0E+00	3.0E-04	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
37	Naphthalene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
38	Nickel	0.0E+00	4.6E-05	1	0.0E+00	2.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	2.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
39	Nitrate	--	4.6E-05	1	0.0E+00	1.6E+00	0E+00	--	2.9E-05	1	0.0E+00	1.6E+00	0E+00	--	4.9E-06	1	0.0E+00	NA	NA
40	Nitrite	--	4.6E-05	1	0.0E+00	1.0E-01	0E+00	--	2.9E-05	1	0.0E+00	1.0E-01	0E+00	--	4.9E-06	1	0.0E+00	NA	NA
41	PCB 1260	0.0E+00	4.6E-05	1	0.0E+00	7.0E-05	0E+00	0.0E+00	2.9E-05	1	0.0E+00	7.0E-05	0E+00	0.0E+00	4.9E-06	1	0.0E+00	7.7E+00	0E+00
42	Phenanthrene	0.0E+00	4.6E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	2.9E-05	1	0.0E+00	4.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
43	Pyrene	0.0E+00	4.6E-05	1	0.0E+00	3.0E-01	0E+00	0.0E+00	2.9E-05	1	0.0E+00	3.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA
44	Silver	0.0E+00	4.6E-05	1	0.0E+00	5.0E-03	0E+00	0.0E+00	2.9E-05	1	0.0E+00	5.0E-03	0E+00	0.0E+00	4.9E-06	1	0.0E+00	NA	NA

45	Sulfide	--	4.6E-05	1	0.0E+00	NA	NA	--	2.9E-05	1	0.0E+00	NA	NA	--	4.9E-06	1	0.0E+00	NA	NA						
46	Tetrachloroeth	0.0E+00	4.6E-05	1	0.0E+00	1.0E-01	0E+00	0.0E+00	2.9E-05	1	0.0E+00	1.0E-02	0E+00	0.0E+00	4.9E-06	1	0.0E+00	5.2E-02	0E+00						
47	Tetrazene	--	4.6E-05	1	0.0E+00	NA	NA	--	2.9E-05	1	0.0E+00	NA	NA	--	4.9E-06	1	0.0E+00	NA	NA						
48	Toluene	2.8E-03	4.6E-05	1	1.3E-07	2.0E+00	6E-08	2.8E-03	2.9E-05	1	8.0E-08	2.0E-01	4E-07	2.8E-03	4.9E-06	1	1.3E-08	NA	NA						
49	Trichloroethen	2.0E-03	4.6E-05	1	9.0E-08	2.0E-02	4E-06	2.0E-03	2.9E-05	1	5.7E-08	2.0E-03	3E-05	2.0E-03	4.9E-06	1	9.6E-09	1.1E-02	1E-10						
50	Uranium (solub	--	4.6E-05	1	0.0E+00	NA	NA	--	2.9E-05	1	0.0E+00	3.0E-03	0E+00	--	4.9E-06	1	0.0E+00	NA	NA						
51	Xylenes (total	1.8E-03	4.6E-05	1	8.1E-08	4.0E+00	2E-08	1.8E-03	2.9E-05	1	5.1E-08	2.0E+00	3E-08	1.8E-03	4.9E-06	1	8.6E-09	NA	NA						

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: PARK SWIMMER

EXPOSURE POINT: RIVER PARK
MEDIUM: SURFACE WATER
ROUTE: DERMAL

HIFs = 4.7E-03
HIFc = 4.1E-03
HIFl = 1.5E-03

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	P	DIs	RfDS	HQs	Cc	HIFc	P	DIc	RfDC	HQc	Cl	HIFl	P	DIl	SF	RISK
1	Acenaphthene	0.0E+00	4.7E-03	1.5E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.5E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.5E-01	0.0E+00	NA	NA
2	Acenaphthylene	0.0E+00	4.7E-03	1.7E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.7E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.7E-01	0.0E+00	NA	NA
3	Aldrin	0.0E+00	4.7E-03	1.6E-03	0.0E+00	3.0E-05	0E+00	0.0E+00	4.1E-03	1.6E-03	0.0E+00	3.0E-05	0E+00	0.0E+00	1.5E-03	1.6E-03	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordan	--	4.7E-03	4.6E-02	0.0E+00	4.8E-05	0E+00	--	4.1E-03	4.6E-02	0.0E+00	4.8E-05	0E+00	--	1.5E-03	4.6E-02	0.0E+00	1.6E+00	0E+00
5	Alpha-endosulf	0.0E+00	4.7E-03	2.1E-03	0.0E+00	2.0E-04	0E+00	0.0E+00	4.1E-03	2.1E-03	0.0E+00	5.0E-05	0E+00	0.0E+00	1.5E-03	2.1E-03	0.0E+00	NA	NA
6	Anthracene	0.0E+00	4.7E-03	2.3E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	2.3E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	2.3E-01	0.0E+00	NA	NA
7	Benzene	0.0E+00	4.7E-03	1.1E-01	0.0E+00	5.0E-02	0E+00	0.0E+00	4.1E-03	1.1E-01	0.0E+00	5.0E-03	0E+00	0.0E+00	1.5E-03	1.1E-01	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	0.0E+00	4.7E-03	8.1E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	8.1E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	8.1E-01	0.0E+00	NA	NA
9	Benzo(a)pyrene	0.0E+00	4.7E-03	1.2E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.2E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.2E+00	0.0E+00	NA	NA
10	Benzo(b)fluora	0.0E+00	4.7E-03	1.2E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.2E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.2E+00	0.0E+00	NA	NA
11	Benzo(g,h,i)pe	0.0E+00	4.7E-03	1.7E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.7E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.7E+00	0.0E+00	NA	NA
12	Benzo(k)fluora	0.0E+00	4.7E-03	1.1E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.1E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.1E+00	0.0E+00	NA	NA
13	Beta-endosulfa	0.0E+00	4.7E-03	2.1E-03	0.0E+00	2.0E-04	0E+00	0.0E+00	4.1E-03	2.1E-03	0.0E+00	5.0E-05	0E+00	0.0E+00	1.5E-03	2.1E-03	0.0E+00	NA	NA
14	Boron	--	4.7E-03	1.0E-03	0.0E+00	9.0E-02	0E+00	--	4.1E-03	1.0E-03	0.0E+00	9.0E-02	0E+00	--	1.5E-03	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	--	4.7E-03	NA	NA	NA	NA	--	4.1E-03	NA	NA	2.5E-05	NA	--	1.5E-03	NA	NA	NA	NA
16	Cadmium (wate	0.0E+00	4.7E-03	1.0E-03	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.0E-03	0.0E+00	2.5E-05	0E+00	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA
17	Chlordane	0.0E+00	4.7E-03	5.2E-02	0.0E+00	6.0E-05	0E+00	0.0E+00	4.1E-03	5.2E-02	0.0E+00	6.0E-05	0E+00	0.0E+00	1.5E-03	5.2E-02	0.0E+00	1.3E+00	0E+00
18	Chromium (VI)	0.0E+00	4.7E-03	1.0E-03	0.0E+00	1.0E-03	0E+00	0.0E+00	4.1E-03	1.0E-03	0.0E+00	2.5E-04	0E+00	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA
19	Chrysene	0.0E+00	4.7E-03	8.1E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	8.1E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	8.1E-01	0.0E+00	NA	NA
20	Cyanide (free)	0.0E+00	4.7E-03	1.0E-03	0.0E+00	2.0E-02	0E+00	0.0E+00	4.1E-03	1.0E-03	0.0E+00	2.0E-02	0E+00	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA
21	DDD, 4,4'-	0.0E+00	4.7E-03	2.8E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	2.8E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	2.8E-01	0.0E+00	2.4E-01	0E+00
22	DDE, 4,4'-	0.0E+00	4.7E-03	2.4E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	2.4E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	2.4E-01	0.0E+00	3.4E-01	0E+00
23	DDT, 4,4'-	0.0E+00	4.7E-03	4.3E-01	0.0E+00	5.0E-04	0E+00	0.0E+00	4.1E-03	4.3E-01	0.0E+00	5.0E-04	0E+00	0.0E+00	1.5E-03	4.3E-01	0.0E+00	3.4E-01	0E+00
24	Dibenz(a,h)ant	0.0E+00	4.7E-03	2.7E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	2.7E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	2.7E+00	0.0E+00	NA	NA
25	Dieldrin	0.0E+00	4.7E-03	1.6E-02	0.0E+00	5.0E-05	0E+00	0.0E+00	4.1E-03	1.6E-02	0.0E+00	5.0E-05	0E+00	0.0E+00	1.5E-03	1.6E-02	0.0E+00	1.6E+01	0E+00
26	Dimethylbenzen	1.8E-03	4.7E-03	8.9E-02	7.7E-07	4.0E+00	2E-07	1.8E-03	4.1E-03	8.9E-02	6.7E-07	2.0E+00	3E-07	1.8E-03	1.5E-03	8.9E-02	2.4E-07	NA	NA
27	Endrin	0.0E+00	4.7E-03	1.6E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	4.1E-03	1.6E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	1.5E-03	1.6E-02	0.0E+00	NA	NA
28	Fluoranthene	0.0E+00	4.7E-03	3.6E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	3.6E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	3.6E-01	0.0E+00	NA	NA
29	Fluorene	0.0E+00	4.7E-03	3.6E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	3.6E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	3.6E-01	0.0E+00	NA	NA
30	Gamma-chlordan	--	4.7E-03	5.2E-02	0.0E+00	4.8E-05	0E+00	--	4.1E-03	5.2E-02	0.0E+00	4.8E-05	0E+00	--	1.5E-03	5.2E-02	0.0E+00	1.6E+00	0E+00
31	Gamma-hexachlo	3.2E-06	4.7E-03	1.4E-01	2.1E-09	3.0E-03	7E-07	3.2E-06	4.1E-03	1.4E-01	1.8E-09	3.0E-04	6E-06	3.2E-06	1.5E-03	1.4E-01	6.7E-10	1.3E+00	9E-10
32	Heptachlor	0.0E+00	4.7E-03	1.1E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	4.1E-03	1.1E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	1.5E-03	1.1E-02	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	0.0E+00	4.7E-03	6.7E-04	0.0E+00	1.3E-05	0E+00	0.0E+00	4.1E-03	6.7E-04	0.0E+00	1.3E-05	0E+00	0.0E+00	1.5E-03	6.7E-04	0.0E+00	9.1E+00	0E+00
34	Indeno(1,2,3-c	0.0E+00	4.7E-03	1.9E+00	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.9E+00	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.9E+00	0.0E+00	NA	NA
35	Lead	0.0E+00	4.7E-03	1.0E-03	0.0E+00	NA	NA	0.0E+00	4.1E-03	1.0E-03	0.0E+00	NA	NA	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA
36	Mercury, inorg	0.0E+00	4.7E-03	1.0E-03	0.0E+00	6.0E-06	0E+00	0.0E+00	4.1E-03	1.0E-03	0.0E+00	6.0E-06	0E+00	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA
37	Naphthalene	0.0E+00	4.7E-03	6.9E-02	0.0E+00	NA	NA	0.0E+00	4.1E-03	6.9E-02	0.0E+00	NA	NA	0.0E+00	1.5E-03	6.9E-02	0.0E+00	NA	NA
38	Nickel	0.0E+00	4.7E-03	NA	NA	1.0E-03	NA	0.0E+00	4.1E-03	NA	NA	1.0E-03	NA	0.0E+00	1.5E-03	NA	NA	NA	NA
39	Nitrate	--	4.7E-03	1.0E-03	0.0E+00	1.6E+00	0E+00	--	4.1E-03	1.0E-03	0.0E+00	1.6E+00	0E+00	--	1.5E-03	1.0E-03	0.0E+00	NA	NA
40	Nitrite	--	4.7E-03	1.0E-03	0.0E+00	1.0E-01	0E+00	--	4.1E-03	1.0E-03	0.0E+00	1.0E-01	0E+00	--	1.5E-03	1.0E-03	0.0E+00	NA	NA
41	PCB 1260	0.0E+00	4.7E-03	3.7E-01	0.0E+00	6.7E-05	0E+00	0.0E+00	4.1E-03	3.7E-01	0.0E+00	6.7E-05	0E+00	0.0E+00	1.5E-03	3.7E-01	0.0E+00	8.1E+00	0E+00
42	Phenanthrene	0.0E+00	4.7E-03	2.3E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	2.3E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	2.3E-01	0.0E+00	NA	NA
43	Pyrene	0.0E+00	4.7E-03	3.3E-01	0.0E+00	NA	NA	0.0E+00	4.1E-03	3.3E-01	0.0E+00	NA	NA	0.0E+00	1.5E-03	3.3E-01	0.0E+00	NA	NA
44	Silver	0.0E+00	4.7E-03	1.0E-03	0.0E+00	2.5E-04	0E+00	0.0E+00	4.1E-03	1.0E-03	0.0E+00	2.5E-04	0E+00	0.0E+00	1.5E-03	1.0E-03	0.0E+00	NA	NA

45	Sulfide	--	4.7E-03	1.0E-03	0.0E+00	NA	NA	--	4.1E-03	1.0E-03	0.0E+00	NA	NA	--	1.5E-03	1.0E-03	0.0E+00	NA	NA
46	Tetrachloroeth	0.0E+00	4.7E-03	3.7E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	4.1E-03	3.7E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	1.5E-03	3.7E-01	0.0E+00	5.2E-02	0E+00
47	Tetrazene	--	4.7E-03		0.0E+00	NA	NA	--	4.1E-03		0.0E+00	NA	NA	--	1.5E-03		0.0E+00	NA	NA
48	Toluene	2.8E-03	4.7E-03	1.0E+00	1.3E-05	2.0E+00	6E-06	2.8E-03	4.1E-03	1.0E+00	1.1E-05	2.0E-01	6E-05	2.8E-03	1.5E-03	1.0E+00	4.1E-06	NA	NA
49	Trichloroethen	2.0E-03	4.7E-03	2.3E-01	2.1E-06	2.0E-02	1E-04	2.0E-03	4.1E-03	2.3E-01	1.8E-06	2.0E-03	9E-04	2.0E-03	1.5E-03	2.3E-01	6.7E-07	1.1E-02	7E-09
50	Uranium (solub	--	4.7E-03	1.0E-03	0.0E+00	NA	NA	--	4.1E-03	1.0E-03	0.0E+00	1.5E-04	0E+00	--	1.5E-03	1.0E-03	0.0E+00	NA	NA
51	Xylenes (total	1.8E-03	4.7E-03	8.9E-02	7.3E-07	4.0E+00	2E-07	1.8E-03	4.1E-03	8.9E-02	6.4E-07	2.0E+00	3E-07	1.8E-03	1.5E-03	8.9E-02	2.3E-07	NA	NA

RANGE NAME: WS3

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: PARK SWIMMER

EXPOSURE POINT: RIVER PARK
MEDIUM: SEDIMENT
ROUTE: ORAL

HIFs = 9.1E-08
HIFc = 5.7E-08
HIFl = 9.7E-09

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	4.2E-01	9.1E-08	1	3.8E-08	6.0E-01	6E-08	4.2E-01	5.7E-08	1	2.4E-08	6.0E-02	4E-07	4.2E-01	9.7E-09	1	4.1E-09	NA	NA
2	Acenaphthylene	1.4E+00	9.1E-08	1	1.3E-07	4.0E-02	3E-06	1.4E+00	5.7E-08	1	8.0E-08	4.0E-02	2E-06	1.4E+00	9.7E-09	1	1.4E-08	NA	NA
3	Aldrin	2.7E-02	9.1E-08	1	2.5E-09	3.0E-05	8E-05	2.7E-02	5.7E-08	1	1.6E-09	3.0E-05	5E-05	2.7E-02	9.7E-09	1	2.7E-10	1.7E+01	5E-09
4	Alpha-chlordan	--	9.1E-08	1	0.0E+00	6.0E-05	0E+00	--	5.7E-08	1	0.0E+00	6.0E-05	0E+00	--	9.7E-09	1	0.0E+00	1.3E+00	0E+00
5	Alpha-endosulf	1.4E-02	9.1E-08	1	1.3E-09	2.0E-04	6E-06	1.4E-02	5.7E-08	1	8.1E-10	5.0E-05	2E-05	1.4E-02	9.7E-09	1	1.4E-10	NA	NA
6	Anthracene	0.0E+00	9.1E-08	1	0.0E+00	3.0E+00	0E+00	0.0E+00	5.7E-08	1	0.0E+00	3.0E-01	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	9.1E-08	1	0.0E+00	5.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	5.0E-03	0E+00	0.0E+00	9.7E-09	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	5.2E+00	9.1E-08	1	4.7E-07	4.0E-02	1E-05	5.2E+00	5.7E-08	1	2.9E-07	4.0E-02	7E-06	5.2E+00	9.7E-09	1	5.0E-08	7.3E+00	4E-07
9	Benzo(a)pyrene	0.0E+00	9.1E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	9.7E-09	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluora	5.5E+00	9.1E-08	1	5.0E-07	4.0E-02	1E-05	5.5E+00	5.7E-08	1	3.1E-07	4.0E-02	8E-06	5.5E+00	9.7E-09	1	5.3E-08	7.3E+00	4E-07
11	Benzo(g,h,i)pe	1.2E+00	9.1E-08	1	1.1E-07	4.0E-02	3E-06	1.2E+00	5.7E-08	1	6.9E-08	4.0E-02	2E-06	1.2E+00	9.7E-09	1	1.2E-08	NA	NA
12	Benzo(k)fluora	6.1E+00	9.1E-08	1	5.6E-07	4.0E-02	1E-05	6.1E+00	5.7E-08	1	3.5E-07	4.0E-02	9E-06	6.1E+00	9.7E-09	1	5.9E-08	7.3E+00	4E-07
13	Beta-endosulfa	4.1E-03	9.1E-08	1	3.7E-10	2.0E-04	2E-06	4.1E-03	5.7E-08	1	2.3E-10	5.0E-05	5E-06	4.1E-03	9.7E-09	1	4.0E-11	NA	NA
14	Boron	--	9.1E-08	1	0.0E+00	9.0E-02	0E+00	--	5.7E-08	1	0.0E+00	9.0E-02	0E+00	--	9.7E-09	1	0.0E+00	NA	NA
15	Cadmium (food	1.1E+01	9.1E-08	1	1.0E-06	NA	NA	1.1E+01	5.7E-08	1	6.4E-07	1.0E-03	6E-04	1.1E+01	9.7E-09	1	1.1E-07	NA	NA
16	Cadmium (wate	--	9.1E-08	1	0.0E+00	NA	NA	--	5.7E-08	1	0.0E+00	5.0E-04	0E+00	--	9.7E-09	1	0.0E+00	NA	NA
17	Chlordane	0.0E+00	9.1E-08	1	0.0E+00	6.0E-05	0E+00	0.0E+00	5.7E-08	1	0.0E+00	6.0E-05	0E+00	0.0E+00	9.7E-09	1	0.0E+00	1.3E+00	0E+00
18	Chromium (VI)	1.3E+02	9.1E-08	1	1.1E-05	2.0E-02	6E-04	1.3E+02	5.7E-08	1	7.2E-06	5.0E-03	1E-03	1.3E+02	9.7E-09	1	1.2E-06	NA	NA
19	Chrysene	6.0E+00	9.1E-08	1	5.5E-07	4.0E-02	1E-05	6.0E+00	5.7E-08	1	3.4E-07	4.0E-02	9E-06	6.0E+00	9.7E-09	1	5.8E-08	7.3E+00	4E-07
20	Cyanide (free)	0.0E+00	9.1E-08	1	0.0E+00	2.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	2.0E-02	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA
21	DDD, 4,4'-	1.5E-01	9.1E-08	1	1.4E-08	NA	NA	1.5E-01	5.7E-08	1	8.6E-09	NA	NA	1.5E-01	9.7E-09	1	1.5E-09	2.4E-01	4E-10
22	DDE, 4,4'-	1.2E-01	9.1E-08	1	1.1E-08	NA	NA	1.2E-01	5.7E-08	1	6.7E-09	NA	NA	1.2E-01	9.7E-09	1	1.1E-09	3.4E-01	4E-10
23	DDT, 4,4'-	2.3E-01	9.1E-08	1	2.1E-08	5.0E-04	4E-05	2.3E-01	5.7E-08	1	1.3E-08	5.0E-04	3E-05	2.3E-01	9.7E-09	1	2.3E-09	3.4E-01	8E-10
24	Dibenz(a,h)ant	0.0E+00	9.1E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	9.7E-09	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	1.5E-02	9.1E-08	1	1.3E-09	5.0E-05	3E-05	1.5E-02	5.7E-08	1	8.4E-10	5.0E-05	2E-05	1.5E-02	9.7E-09	1	1.4E-10	1.6E+01	2E-09
26	Dimethylbenzen	0.0E+00	9.1E-08	1	0.0E+00	4.0E+00	0E+00	0.0E+00	5.7E-08	1	0.0E+00	2.0E+00	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA
27	Endrin	1.0E-02	9.1E-08	1	9.2E-10	3.0E-04	3E-06	1.0E-02	5.7E-08	1	5.8E-10	3.0E-04	2E-06	1.0E-02	9.7E-09	1	9.8E-11	NA	NA
28	Fluoranthene	8.2E+00	9.1E-08	1	7.5E-07	4.0E-01	2E-06	8.2E+00	5.7E-08	1	4.7E-07	4.0E-02	1E-05	8.2E+00	9.7E-09	1	8.0E-08	NA	NA
29	Fluorene	1.0E+00	9.1E-08	1	9.5E-08	4.0E-01	2E-07	1.0E+00	5.7E-08	1	5.9E-08	4.0E-02	1E-06	1.0E+00	9.7E-09	1	1.0E-08	NA	NA
30	Gamma-chlordan	0.0E+00	9.1E-08	1	0.0E+00	6.0E-05	0E+00	0.0E+00	5.7E-08	1	0.0E+00	6.0E-05	0E+00	0.0E+00	9.7E-09	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlo	0.0E+00	9.1E-08	1	0.0E+00	3.0E-03	0E+00	0.0E+00	5.7E-08	1	0.0E+00	3.0E-04	0E+00	0.0E+00	9.7E-09	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	9.1E-08	1	0.0E+00	5.0E-04	0E+00	0.0E+00	5.7E-08	1	0.0E+00	5.0E-04	0E+00	0.0E+00	9.7E-09	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	7.0E-03	9.1E-08	1	6.3E-10	1.3E-05	5E-05	7.0E-03	5.7E-08	1	4.0E-10	1.3E-05	3E-05	7.0E-03	9.7E-09	1	6.8E-11	9.1E+00	6E-10
34	Indeno(1,2,3-c	1.0E+01	9.1E-08	1	9.2E-07	4.0E-02	2E-05	1.0E+01	5.7E-08	1	5.7E-07	4.0E-02	1E-05	1.0E+01	9.7E-09	1	9.8E-08	7.3E+00	7E-07
35	Lead	6.3E+02	9.1E-08	1	5.8E-05	NA	NA	6.3E+02	5.7E-08	1	3.6E-05	NA	NA	6.3E+02	9.7E-09	1	6.1E-06	NA	NA
36	Mercury, inorg	8.1E-01	9.1E-08	1	7.4E-08	3.0E-04	2E-04	8.1E-01	5.7E-08	1	4.6E-08	3.0E-04	2E-04	8.1E-01	9.7E-09	1	7.8E-09	NA	NA
37	Naphthalene	0.0E+00	9.1E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	4.0E-02	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA
38	Nickel	4.0E+01	9.1E-08	1	3.6E-06	2.0E-02	2E-04	4.0E+01	5.7E-08	1	2.3E-06	2.0E-02	1E-04	4.0E+01	9.7E-09	1	3.8E-07	NA	NA
39	Nitrate	--	9.1E-08	1	0.0E+00	1.6E+00	0E+00	--	5.7E-08	1	0.0E+00	1.6E+00	0E+00	--	9.7E-09	1	0.0E+00	NA	NA
40	Nitrite	--	9.1E-08	1	0.0E+00	1.0E-01	0E+00	--	5.7E-08	1	0.0E+00	1.0E-01	0E+00	--	9.7E-09	1	0.0E+00	NA	NA
41	PCB 1260	0.0E+00	9.1E-08	1	0.0E+00	7.0E-05	0E+00	0.0E+00	5.7E-08	1	0.0E+00	7.0E-05	0E+00	0.0E+00	9.7E-09	1	0.0E+00	7.7E+00	0E+00
42	Phenanthrene	6.1E+00	9.1E-08	1	5.6E-07	4.0E-02	1E-05	6.1E+00	5.7E-08	1	3.5E-07	4.0E-02	9E-06	6.1E+00	9.7E-09	1	5.9E-08	NA	NA
43	Pyrene	1.0E+01	9.1E-08	1	9.1E-07	3.0E-01	3E-06	1.0E+01	5.7E-08	1	5.7E-07	3.0E-02	2E-05	1.0E+01	9.7E-09	1	9.7E-08	NA	NA
44	Silver	2.5E+00	9.1E-08	1	2.3E-07	5.0E-03	5E-05	2.5E+00	5.7E-08	1	1.4E-07	5.0E-03	3E-05	2.5E+00	9.7E-09	1	2.5E-08	NA	NA

45 Sulfide	--	9.1E-08	1	0.0E+00	NA	NA	--	5.7E-08	1	0.0E+00	NA	NA	--	9.7E-09	1	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	9.1E-08	1	0.0E+00	1.0E-01	0E+00	0.0E+00	5.7E-08	1	0.0E+00	1.0E-02	0E+00	0.0E+00	9.7E-09	1	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	9.1E-08	1	0.0E+00	NA	NA	--	5.7E-08	1	0.0E+00	NA	NA	--	9.7E-09	1	0.0E+00	NA	NA
48 Toluene	0.0E+00	9.1E-08	1	0.0E+00	2.0E+00	0E+00	0.0E+00	5.7E-08	1	0.0E+00	2.0E-01	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	9.1E-08	1	0.0E+00	2.0E-02	0E+00	0.0E+00	5.7E-08	1	0.0E+00	2.0E-03	0E+00	0.0E+00	9.7E-09	1	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	--	9.1E-08	1	0.0E+00	NA	NA	--	5.7E-08	1	0.0E+00	3.0E-03	0E+00	--	9.7E-09	1	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	9.1E-08	1	0.0E+00	4.0E+00	0E+00	0.0E+00	5.7E-08	1	0.0E+00	2.0E+00	0E+00	0.0E+00	9.7E-09	1	0.0E+00	NA	NA

RANGE NAME: WS4

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: PARK SWIMMER

EXPOSURE POINT: RIVER PARK
MEDIUM: SEDIMENT
ROUTE: DERMAL

HIFs = 2.3E-06
HIFc = 2.2E-06
HIFl = 5.6E-07

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	4.2E-01	2.3E-06	NA	NA	NA	NA	4.2E-01	2.2E-06	NA	NA	NA	NA	4.2E-01	5.6E-07	NA	NA	NA	NA
2	Acenaphthylene	1.4E+00	2.3E-06	NA	NA	NA	NA	1.4E+00	2.2E-06	NA	NA	NA	NA	1.4E+00	5.6E-07	NA	NA	NA	NA
3	Aldrin	2.7E-02	2.3E-06	1.0E-02	6.3E-10	3.0E-05	2E-05	2.7E-02	2.2E-06	1.0E-02	6.0E-10	3.0E-05	2E-05	2.7E-02	5.6E-07	1.0E-02	1.5E-10	1.7E+01	3E-09
4	Alpha-chlordan	--	2.3E-06	1.0E-02	0.0E+00	4.8E-05	0E+00	--	2.2E-06	1.0E-02	0.0E+00	4.8E-05	0E+00	--	5.6E-07	1.0E-02	0.0E+00	1.6E+00	0E+00
5	Alpha-endosulf	1.4E-02	2.3E-06	1.0E-02	3.3E-10	2.0E-04	2E-06	1.4E-02	2.2E-06	1.0E-02	3.1E-10	5.0E-05	6E-06	1.4E-02	5.6E-07	1.0E-02	7.9E-11	NA	NA
6	Anthracene	0.0E+00	2.3E-06	NA	NA	NA	NA	0.0E+00	2.2E-06	NA	NA	NA	NA	0.0E+00	5.6E-07	NA	NA	NA	NA
7	Benzene	0.0E+00	2.3E-06	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	2.2E-06	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	5.6E-07	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	5.2E+00	2.3E-06	NA	NA	NA	NA	5.2E+00	2.2E-06	NA	NA	NA	NA	5.2E+00	5.6E-07	NA	NA	NA	NA
9	Benzo(a)pyrene	0.0E+00	2.3E-06	NA	NA	NA	NA	0.0E+00	2.2E-06	NA	NA	NA	NA	0.0E+00	5.6E-07	NA	NA	NA	NA
10	Benzo(b)fluora	5.5E+00	2.3E-06	NA	NA	NA	NA	5.5E+00	2.2E-06	NA	NA	NA	NA	5.5E+00	5.6E-07	NA	NA	NA	NA
11	Benzo(g,h,i)pe	1.2E+00	2.3E-06	NA	NA	NA	NA	1.2E+00	2.2E-06	NA	NA	NA	NA	1.2E+00	5.6E-07	NA	NA	NA	NA
12	Benzo(k)fluora	6.1E+00	2.3E-06	NA	NA	NA	NA	6.1E+00	2.2E-06	NA	NA	NA	NA	6.1E+00	5.6E-07	NA	NA	NA	NA
13	Beta-endosulfa	4.1E-03	2.3E-06	1.0E-02	9.4E-11	2.0E-04	5E-07	4.1E-03	2.2E-06	1.0E-02	9.0E-11	5.0E-05	2E-06	4.1E-03	5.6E-07	1.0E-02	2.3E-11	NA	NA
14	Boron	--	2.3E-06	1.0E-03	0.0E+00	9.0E-02	0E+00	--	2.2E-06	1.0E-03	0.0E+00	9.0E-02	0E+00	--	5.6E-07	1.0E-03	0.0E+00	NA	NA
15	Cadmium (food	1.1E+01	2.3E-06	1.0E-02	2.6E-07	NA	NA	1.1E+01	2.2E-06	1.0E-02	2.5E-07	2.5E-05	1E-02	1.1E+01	5.6E-07	1.0E-02	6.3E-08	NA	NA
16	Cadmium (wate	--	2.3E-06	NA	NA	NA	NA	--	2.2E-06	NA	NA	2.5E-05	NA	--	5.6E-07	NA	NA	NA	NA
17	Chlordane	0.0E+00	2.3E-06	1.0E-02	0.0E+00	6.0E-05	0E+00	0.0E+00	2.2E-06	1.0E-02	0.0E+00	6.0E-05	0E+00	0.0E+00	5.6E-07	1.0E-02	0.0E+00	1.3E+00	0E+00
18	Chromium (VI)	1.3E+02	2.3E-06	NA	NA	1.0E-03	NA	1.3E+02	2.2E-06	NA	NA	2.5E-04	NA	1.3E+02	5.6E-07	NA	NA	NA	NA
19	Chrysene	6.0E+00	2.3E-06	NA	NA	NA	NA	6.0E+00	2.2E-06	NA	NA	NA	NA	6.0E+00	5.6E-07	NA	NA	NA	NA
20	Cyanide (free)	0.0E+00	2.3E-06	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	2.2E-06	3.0E-02	0.0E+00	2.0E-02	0E+00	0.0E+00	5.6E-07	3.0E-02	0.0E+00	NA	NA
21	DDD, 4,4'-	1.5E-01	2.3E-06	1.0E-02	3.5E-09	NA	NA	1.5E-01	2.2E-06	1.0E-02	3.3E-09	NA	NA	1.5E-01	5.6E-07	1.0E-02	8.4E-10	2.4E-01	2E-10
22	DDE, 4,4'-	1.2E-01	2.3E-06	1.0E-02	2.7E-09	NA	NA	1.2E-01	2.2E-06	1.0E-02	2.6E-09	NA	NA	1.2E-01	5.6E-07	1.0E-02	6.6E-10	3.4E-01	2E-10
23	DDT, 4,4'-	2.3E-01	2.3E-06	1.0E-02	5.4E-09	5.0E-04	1E-05	2.3E-01	2.2E-06	1.0E-02	5.1E-09	5.0E-04	1E-05	2.3E-01	5.6E-07	1.0E-02	1.3E-09	3.4E-01	4E-10
24	Dibenz(a,h)ant	0.0E+00	2.3E-06	NA	NA	NA	NA	0.0E+00	2.2E-06	NA	NA	NA	NA	0.0E+00	5.6E-07	NA	NA	NA	NA
25	Dieldrin	1.5E-02	2.3E-06	1.0E-02	3.4E-10	5.0E-05	7E-06	1.5E-02	2.2E-06	1.0E-02	3.2E-10	5.0E-05	6E-06	1.5E-02	5.6E-07	1.0E-02	8.3E-11	1.6E+01	1E-09
26	Dimethylbenzen	0.0E+00	2.3E-06	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	2.2E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	5.6E-07	1.2E-01	0.0E+00	NA	NA
27	Endrin	1.0E-02	2.3E-06	1.0E-02	2.3E-10	3.0E-04	8E-07	1.0E-02	2.2E-06	1.0E-02	2.2E-10	3.0E-04	7E-07	1.0E-02	5.6E-07	1.0E-02	5.7E-11	NA	NA
28	Fluoranthene	8.2E+00	2.3E-06	NA	NA	NA	NA	8.2E+00	2.2E-06	NA	NA	NA	NA	8.2E+00	5.6E-07	NA	NA	NA	NA
29	Fluorene	1.0E+00	2.3E-06	NA	NA	NA	NA	1.0E+00	2.2E-06	NA	NA	NA	NA	1.0E+00	5.6E-07	NA	NA	NA	NA
30	Gamma-chlordan	0.0E+00	2.3E-06	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	2.2E-06	1.0E-02	0.0E+00	4.8E-05	0E+00	0.0E+00	5.6E-07	1.0E-02	0.0E+00	1.6E+00	0E+00
31	Gamma-hexachlo	0.0E+00	2.3E-06	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	2.2E-06	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	5.6E-07	1.0E-02	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	2.3E-06	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	2.2E-06	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	5.6E-07	1.0E-02	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	7.0E-03	2.3E-06	1.0E-02	1.6E-10	1.3E-05	1E-05	7.0E-03	2.2E-06	1.0E-02	1.5E-10	1.3E-05	1E-05	7.0E-03	5.6E-07	1.0E-02	3.9E-11	9.1E+00	4E-10
34	Indeno(1,2,3-c	1.0E+01	2.3E-06	NA	NA	NA	NA	1.0E+01	2.2E-06	NA	NA	NA	NA	1.0E+01	5.6E-07	NA	NA	NA	NA
35	Lead	6.3E+02	2.3E-06	6.0E-03	8.7E-06	NA	NA	6.3E+02	2.2E-06	6.0E-03	8.4E-06	NA	NA	6.3E+02	5.6E-07	6.0E-03	2.1E-06	NA	NA
36	Mercury, inorg	8.1E-01	2.3E-06	1.0E-03	1.9E-09	6.0E-06	3E-04	8.1E-01	2.2E-06	1.0E-03	1.8E-09	6.0E-06	3E-04	8.1E-01	5.6E-07	1.0E-03	4.5E-10	NA	NA
37	Naphthalene	0.0E+00	2.3E-06	NA	NA	NA	NA	0.0E+00	2.2E-06	NA	NA	NA	NA	0.0E+00	5.6E-07	NA	NA	NA	NA
38	Nickel	4.0E+01	2.3E-06	NA	NA	1.0E-03	NA	4.0E+01	2.2E-06	NA	NA	1.0E-03	NA	4.0E+01	5.6E-07	NA	NA	NA	NA
39	Nitrate	--	2.3E-06	1.0E-03	0.0E+00	1.6E+00	0E+00	--	2.2E-06	1.0E-03	0.0E+00	1.6E+00	0E+00	--	5.6E-07	1.0E-03	0.0E+00	NA	NA
40	Nitrite	--	2.3E-06	1.0E-03	0.0E+00	1.0E-01	0E+00	--	2.2E-06	1.0E-03	0.0E+00	1.0E-01	0E+00	--	5.6E-07	1.0E-03	0.0E+00	NA	NA
41	PCB 1260	0.0E+00	2.3E-06	6.0E-02	0.0E+00	6.7E-05	0E+00	0.0E+00	2.2E-06	6.0E-02	0.0E+00	6.7E-05	0E+00	0.0E+00	5.6E-07	6.0E-02	0.0E+00	8.1E+00	0E+00
42	Phenanthrene	6.1E+00	2.3E-06	NA	NA	NA	NA	6.1E+00	2.2E-06	NA	NA	NA	NA	6.1E+00	5.6E-07	NA	NA	NA	NA
43	Pyrene	1.0E+01	2.3E-06	NA	NA	NA	NA	1.0E+01	2.2E-06	NA	NA	NA	NA	1.0E+01	5.6E-07	NA	NA	NA	NA
44	Silver	2.5E+00	2.3E-06	1.0E-02	5.8E-08	2.5E-04	2E-04	2.5E+00	2.2E-06	1.0E-02	5.6E-08	2.5E-04	2E-04	2.5E+00	5.6E-07	1.0E-02	1.4E-08	NA	NA

45 Sulfide	--	2.3E-06	1.0E-03	0.0E+00	NA	NA	--	2.2E-06	1.0E-03	0.0E+00	NA	NA	--	5.6E-07	1.0E-03	0.0E+00	NA	NA
46 Tetrachloroeth	0.0E+00	2.3E-06	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	2.2E-06	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	5.6E-07	1.0E-01	0.0E+00	5.2E-02	0E+00
47 Tetrazene	--	2.3E-06	1.0E-02	0.0E+00	NA	NA	--	2.2E-06	1.0E-02	0.0E+00	NA	NA	--	5.6E-07	1.0E-02	0.0E+00	NA	NA
48 Toluene	0.0E+00	2.3E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	2.2E-06	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	5.6E-07	1.2E-01	0.0E+00	NA	NA
49 Trichloroethen	0.0E+00	2.3E-06	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	2.2E-06	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	5.6E-07	1.0E-01	0.0E+00	1.1E-02	0E+00
50 Uranium (solub	--	2.3E-06	1.0E-03	0.0E+00	NA	NA	--	2.2E-06	1.0E-03	0.0E+00	1.5E-04	0E+00	--	5.6E-07	1.0E-03	0.0E+00	NA	NA
51 Xylenes (total	0.0E+00	2.3E-06	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	2.2E-06	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	5.6E-07	1.2E-01	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
PARK SWIMMER

SUBCHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	3.8E-08	NA	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00	1.3E-07	NA		
3	Aldrin	0.0E+00	0.0E+00	2.5E-09	6.3E-10		
4	Alpha-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
5	Alpha-endosulf	0.0E+00	0.0E+00	1.3E-09	3.3E-10		
6	Anthracene	0.0E+00	0.0E+00	0.0E+00	NA		
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
8	Benzo(a)anthra	0.0E+00	0.0E+00	4.7E-07	NA		
9	Benzo(a)pyrene	0.0E+00	0.0E+00	0.0E+00	NA		
10	Benzo(b)fluora	0.0E+00	0.0E+00	5.0E-07	NA		
11	Benzo(g,h,i)pe	0.0E+00	0.0E+00	1.1E-07	NA		
12	Benzo(k)fluora	0.0E+00	0.0E+00	5.6E-07	NA		
13	Beta-endosulfa	0.0E+00	0.0E+00	3.7E-10	9.4E-11		
14	Boron	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
15	Cadmium (food	0.0E+00	NA	1.0E-06	2.6E-07		
16	Cadmium (wate	0.0E+00	0.0E+00	0.0E+00	NA		
17	Chlordane	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
18	Chromium (VI)	0.0E+00	0.0E+00	1.1E-05	NA		
19	Chrysene	0.0E+00	0.0E+00	5.5E-07	NA		
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
21	DDD, 4,4'-	0.0E+00	0.0E+00	1.4E-08	3.5E-09		
22	DDE, 4,4'-	0.0E+00	0.0E+00	1.1E-08	2.7E-09		
23	DDT, 4,4'-	0.0E+00	0.0E+00	2.1E-08	5.4E-09		
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00	NA		
25	Dieldrin	0.0E+00	0.0E+00	1.3E-09	3.4E-10		
26	Dimethylbenzen	8.5E-08	7.7E-07	0.0E+00	0.0E+00		
27	Endrin	0.0E+00	0.0E+00	9.2E-10	2.3E-10		
28	Fluoranthene	0.0E+00	0.0E+00	7.5E-07	NA		
29	Fluorene	0.0E+00	0.0E+00	9.5E-08	NA		
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
31	Gamma-hexachlo	1.5E-10	2.1E-09	0.0E+00	0.0E+00		
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
33	Heptachlor epo	0.0E+00	0.0E+00	6.3E-10	1.6E-10		
34	Indeno(1,2,3-c	0.0E+00	0.0E+00	9.2E-07	NA		
35	Lead	0.0E+00	0.0E+00	5.8E-05	8.7E-06		
36	Mercury, inorg	0.0E+00	0.0E+00	7.4E-08	1.9E-09		
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	NA		
38	Nickel	0.0E+00	NA	3.6E-06	NA		
39	Nitrate	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
40	Nitrite	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
41	PCB 1260	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
42	Phenanthrene	0.0E+00	0.0E+00	5.6E-07	NA		
43	Pyrene	0.0E+00	0.0E+00	9.1E-07	NA		
44	Silver	0.0E+00	0.0E+00	2.3E-07	5.8E-08		
45	Sulfide	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
47	Tetrazene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		

SUBCHRONIC RISK SUMMARY

FUTURE
PARK SWIMMER

SUBCHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0E+00	NA	6E-08	NA	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	3E-06	NA		
3	Aldrin	0E+00	0E+00	8E-05	2E-05		
4	Alpha-chlordan	0E+00	0E+00	0E+00	0E+00		
5	Alpha-endosulf	0E+00	0E+00	6E-06	2E-06		
6	Anthracene	0E+00	NA	0E+00	NA		
7	Benzene	0E+00	0E+00	0E+00	0E+00		
8	Benzo(a)anthra	0E+00	NA	1E-05	NA		
9	Benzo(a)pyrene	0E+00	NA	0E+00	NA		
10	Benzo(b)fluora	0E+00	NA	1E-05	NA		
11	Benzo(g,h,i)pe	0E+00	NA	3E-06	NA		
12	Benzo(k)fluora	0E+00	NA	1E-05	NA		
13	Beta-endosulfa	0E+00	0E+00	2E-06	5E-07		
14	Boron	0E+00	0E+00	0E+00	0E+00		
15	Cadmium (food	NA	NA	NA	NA		
16	Cadmium (wate	NA	NA	NA	NA		
17	Chlordane	0E+00	0E+00	0E+00	0E+00		
18	Chromium (VI)	0E+00	0E+00	6E-04	NA		
19	Chrysene	0E+00	NA	1E-05	NA		
20	Cyanide (free)	0E+00	0E+00	0E+00	0E+00		
21	DDD, 4,4'-	NA	NA	NA	NA		
22	DDE, 4,4'-	NA	NA	NA	NA		
23	DDT, 4,4'-	0E+00	0E+00	4E-05	1E-05		
24	Dibenz(a,h)ant	0E+00	NA	0E+00	NA		
25	Dieldrin	0E+00	0E+00	3E-05	7E-06		
26	Dimethylbenzen	2E-08	2E-07	0E+00	0E+00		
27	Endrin	0E+00	0E+00	3E-06	8E-07		
28	Fluoranthene	0E+00	NA	2E-06	NA		
29	Fluorene	0E+00	NA	2E-07	NA		
30	Gamma-chlordan	0E+00	0E+00	0E+00	0E+00		
31	Gamma-hexachlo	5E-08	7E-07	0E+00	0E+00		
32	Heptachlor	0E+00	0E+00	0E+00	0E+00		
33	Heptachlor epo	0E+00	0E+00	5E-05	1E-05		
34	Indeno(1,2,3-c	0E+00	NA	2E-05	NA		
35	Lead	NA	NA	NA	NA		
36	Mercury, inorg	0E+00	0E+00	2E-04	3E-04		
37	Naphthalene	0E+00	NA	0E+00	NA		
38	Nickel	0E+00	NA	2E-04	NA		
39	Nitrate	0E+00	0E+00	0E+00	0E+00		
40	Nitrite	0E+00	0E+00	0E+00	0E+00		
41	PCB 1260	0E+00	0E+00	0E+00	0E+00		
42	Phenanthrene	0E+00	NA	1E-05	NA		
43	Pyrene	0E+00	NA	3E-06	NA		
44	Silver	0E+00	0E+00	5E-05	2E-04		
45	Sulfide	NA	NA	NA	NA		
46	Tetrachloroeth	0E+00	0E+00	0E+00	0E+00		
47	Tetrazene	NA	NA	NA	NA		

48 Toluene	1.3E-07	1.3E-05	0.0E+00	0.0E+00		6E-08	6E-06	0E+00	0E+00		
49 Trichloroethen	9.0E-08	2.1E-06	0.0E+00	0.0E+00		4E-06	1E-04	0E+00	0E+00		
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00		NA	NA	NA	NA		
51 Xylenes (total	8.1E-08	7.3E-07	0.0E+00	0.0E+00		2E-08	2E-07	0E+00	0E+00		
					PATHWAY SUM (HI)	4E-06	1E-04	1E-03	6E-04	0E+00	0E+00
					POPULATION TOTAL	2E-03					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
PARK SWIMMER

CHRONIC DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	2.4E-08	NA	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00	8.0E-08	NA		
3	Aldrin	0.0E+00	0.0E+00	1.6E-09	6.0E-10		
4	Alpha-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
5	Alpha-endosulf	0.0E+00	0.0E+00	8.1E-10	3.1E-10		
6	Anthracene	0.0E+00	0.0E+00	0.0E+00	NA		
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
8	Benzo(a)anthra	0.0E+00	0.0E+00	2.9E-07	NA		
9	Benzo(a)pyrene	0.0E+00	0.0E+00	0.0E+00	NA		
10	Benzo(b)fluora	0.0E+00	0.0E+00	3.1E-07	NA		
11	Benzo(g,h,i)pe	0.0E+00	0.0E+00	6.9E-08	NA		
12	Benzo(k)fluora	0.0E+00	0.0E+00	3.5E-07	NA		
13	Beta-endosulfa	0.0E+00	0.0E+00	2.3E-10	9.0E-11		
14	Boron	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
15	Cadmium (food	0.0E+00	NA	6.4E-07	2.5E-07		
16	Cadmium (wate	0.0E+00	0.0E+00	0.0E+00	NA		
17	Chlordane	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
18	Chromium (VI)	0.0E+00	0.0E+00	7.2E-06	NA		
19	Chrysene	0.0E+00	0.0E+00	3.4E-07	NA		
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
21	DDD, 4,4'-	0.0E+00	0.0E+00	8.6E-09	3.3E-09		
22	DDE, 4,4'-	0.0E+00	0.0E+00	6.7E-09	2.6E-09		
23	DDT, 4,4'-	0.0E+00	0.0E+00	1.3E-08	5.1E-09		
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00	NA		
25	Dieldrin	0.0E+00	0.0E+00	8.4E-10	3.2E-10		
26	Dimethylbenzen	5.3E-08	6.7E-07	0.0E+00	0.0E+00		
27	Endrin	0.0E+00	0.0E+00	5.8E-10	2.2E-10		
28	Fluoranthene	0.0E+00	0.0E+00	4.7E-07	NA		
29	Fluorene	0.0E+00	0.0E+00	5.9E-08	NA		
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
31	Gamma-hexachlo	9.3E-11	1.8E-09	0.0E+00	0.0E+00		
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
33	Heptachlor epo	0.0E+00	0.0E+00	4.0E-10	1.5E-10		
34	Indeno(1,2,3-c	0.0E+00	0.0E+00	5.7E-07	NA		
35	Lead	0.0E+00	0.0E+00	3.6E-05	8.4E-06		
36	Mercury, inorg	0.0E+00	0.0E+00	4.6E-08	1.8E-09		
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	NA		
38	Nickel	0.0E+00	NA	2.3E-06	NA		
39	Nitrate	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
40	Nitrite	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
41	PCB 1260	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
42	Phenanthrene	0.0E+00	0.0E+00	3.5E-07	NA		
43	Pyrene	0.0E+00	0.0E+00	5.7E-07	NA		
44	Silver	0.0E+00	0.0E+00	1.4E-07	5.6E-08		
45	Sulfide	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
47	Tetrazene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		

CHRONIC RISK SUMMARY

FUTURE
PARK SWIMMER

CHRONIC HAZARD QUOTIENT

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0E+00	NA	4E-07	NA	0E+00	0E+00
2	Acenaphthylene	0E+00	NA	2E-06	NA		
3	Aldrin	0E+00	0E+00	5E-05	2E-05		
4	Alpha-chlordan	0E+00	0E+00	0E+00	0E+00		
5	Alpha-endosulf	0E+00	0E+00	2E-05	6E-06		
6	Anthracene	0E+00	NA	0E+00	NA		
7	Benzene	0E+00	0E+00	0E+00	0E+00		
8	Benzo(a)anthra	0E+00	NA	7E-06	NA		
9	Benzo(a)pyrene	0E+00	NA	0E+00	NA		
10	Benzo(b)fluora	0E+00	NA	8E-06	NA		
11	Benzo(g,h,i)pe	0E+00	NA	2E-06	NA		
12	Benzo(k)fluora	0E+00	NA	9E-06	NA		
13	Beta-endosulfa	0E+00	0E+00	5E-06	2E-06		
14	Boron	0E+00	0E+00	0E+00	0E+00		
15	Cadmium (food	0E+00	NA	6E-04	1E-02		
16	Cadmium (wate	0E+00	0E+00	0E+00	NA		
17	Chlordane	0E+00	0E+00	0E+00	0E+00		
18	Chromium (VI)	0E+00	0E+00	1E-03	NA		
19	Chrysene	0E+00	NA	9E-06	NA		
20	Cyanide (free)	0E+00	0E+00	0E+00	0E+00		
21	DDD, 4,4'-	NA	NA	NA	NA		
22	DDE, 4,4'-	NA	NA	NA	NA		
23	DDT, 4,4'-	0E+00	0E+00	3E-05	1E-05		
24	Dibenz(a,h)ant	0E+00	NA	0E+00	NA		
25	Dieldrin	0E+00	0E+00	2E-05	6E-06		
26	Dimethylbenzen	3E-08	3E-07	0E+00	0E+00		
27	Endrin	0E+00	0E+00	2E-06	7E-07		
28	Fluoranthene	0E+00	NA	1E-05	NA		
29	Fluorene	0E+00	NA	1E-06	NA		
30	Gamma-chlordan	0E+00	0E+00	0E+00	0E+00		
31	Gamma-hexachlo	3E-07	6E-06	0E+00	0E+00		
32	Heptachlor	0E+00	0E+00	0E+00	0E+00		
33	Heptachlor epo	0E+00	0E+00	3E-05	1E-05		
34	Indeno(1,2,3-c	0E+00	NA	1E-05	NA		
35	Lead	NA	NA	NA	NA		
36	Mercury, inorg	0E+00	0E+00	2E-04	3E-04		
37	Naphthalene	0E+00	NA	0E+00	NA		
38	Nickel	0E+00	NA	1E-04	NA		
39	Nitrate	0E+00	0E+00	0E+00	0E+00		
40	Nitrite	0E+00	0E+00	0E+00	0E+00		
41	PCB 1260	0E+00	0E+00	0E+00	0E+00		
42	Phenanthrene	0E+00	NA	9E-06	NA		
43	Pyrene	0E+00	NA	2E-05	NA		
44	Silver	0E+00	0E+00	3E-05	2E-04		
45	Sulfide	NA	NA	NA	NA		
46	Tetrachloroeth	0E+00	0E+00	0E+00	0E+00		
47	Tetrazene	NA	NA	NA	NA		

48 Toluene	8.0E-08	1.1E-05	0.0E+00	0.0E+00		4E-07	6E-05	0E+00	0E+00		
49 Trichloroethen	5.7E-08	1.8E-06	0.0E+00	0.0E+00		3E-05	9E-04	0E+00	0E+00		
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0E+00	0E+00	0E+00	0E+00		
51 Xylenes (total	5.1E-08	6.4E-07	0.0E+00	0.0E+00		3E-08	3E-07	0E+00	0E+00		
					PATHWAY SUM (HI)	3E-05	1E-03	2E-03	1E-02	0E+00	0E+00
					POPULATION TOTAL	1E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP2
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
PARK SWIMMER

LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	4.1E-09	NA	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	0.0E+00	1.4E-08	NA		
3	Aldrin	0.0E+00	0.0E+00	2.7E-10	1.5E-10		
4	Alpha-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
5	Alpha-endosulf	0.0E+00	0.0E+00	1.4E-10	7.9E-11		
6	Anthracene	0.0E+00	0.0E+00	0.0E+00	NA		
7	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
8	Benzo(a)anthra	0.0E+00	0.0E+00	5.0E-08	NA		
9	Benzo(a)pyrene	0.0E+00	0.0E+00	0.0E+00	NA		
10	Benzo(b)fluora	0.0E+00	0.0E+00	5.3E-08	NA		
11	Benzo(g,h,i)pe	0.0E+00	0.0E+00	1.2E-08	NA		
12	Benzo(k)fluora	0.0E+00	0.0E+00	5.9E-08	NA		
13	Beta-endosulfa	0.0E+00	0.0E+00	4.0E-11	2.3E-11		
14	Boron	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
15	Cadmium (food	0.0E+00	NA	1.1E-07	6.3E-08		
16	Cadmium (wate	0.0E+00	0.0E+00	0.0E+00	NA		
17	Chlordane	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
18	Chromium (VI)	0.0E+00	0.0E+00	1.2E-06	NA		
19	Chrysene	0.0E+00	0.0E+00	5.8E-08	NA		
20	Cyanide (free)	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
21	DDD, 4,4'-	0.0E+00	0.0E+00	1.5E-09	8.4E-10		
22	DDE, 4,4'-	0.0E+00	0.0E+00	1.1E-09	6.6E-10		
23	DDT, 4,4'-	0.0E+00	0.0E+00	2.3E-09	1.3E-09		
24	Dibenz(a,h)ant	0.0E+00	0.0E+00	0.0E+00	NA		
25	Dieldrin	0.0E+00	0.0E+00	1.4E-10	8.3E-11		
26	Dimethylbenzen	9.0E-09	2.4E-07	0.0E+00	0.0E+00		
27	Endrin	0.0E+00	0.0E+00	9.8E-11	5.7E-11		
28	Fluoranthene	0.0E+00	0.0E+00	8.0E-08	NA		
29	Fluorene	0.0E+00	0.0E+00	1.0E-08	NA		
30	Gamma-chlordan	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
31	Gamma-hexachlo	1.6E-11	6.7E-10	0.0E+00	0.0E+00		
32	Heptachlor	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
33	Heptachlor epo	0.0E+00	0.0E+00	6.8E-11	3.9E-11		
34	Indeno(1,2,3-c	0.0E+00	0.0E+00	9.8E-08	NA		
35	Lead	0.0E+00	0.0E+00	6.1E-06	2.1E-06		
36	Mercury, inorg	0.0E+00	0.0E+00	7.8E-09	4.5E-10		
37	Naphthalene	0.0E+00	0.0E+00	0.0E+00	NA		
38	Nickel	0.0E+00	NA	3.8E-07	NA		
39	Nitrate	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
40	Nitrite	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
41	PCB 1260	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
42	Phenanthrene	0.0E+00	0.0E+00	5.9E-08	NA		
43	Pyrene	0.0E+00	0.0E+00	9.7E-08	NA		
44	Silver	0.0E+00	0.0E+00	2.5E-08	1.4E-08		
45	Sulfide	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
46	Tetrachloroeth	0.0E+00	0.0E+00	0.0E+00	0.0E+00		
47	Tetrazene	0.0E+00	0.0E+00	0.0E+00	0.0E+00		

LIFETIME RISK SUMMARY

FUTURE
PARK SWIMMER

LIFETIME EXCESS CANCER RISK

	CHEMICAL NAME	SCENARIO 1 RIVER PARK SURFACE WAT ORAL (FROM WS1)	SCENARIO 2 RIVER PARK SURFACE WAT DERMAL (FROM WS2)	SCENARIO 3 RIVER PARK SEDIMENT ORAL (FROM WS3)	SCENARIO 4 RIVER PARK SEDIMENT DERMAL (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	NA	NA	0E+00	0E+00
2	Acenaphthylene	NA	NA	NA	NA		
3	Aldrin	0E+00	0E+00	5E-09	3E-09		
4	Alpha-chlordan	0E+00	0E+00	0E+00	0E+00		
5	Alpha-endosulf	NA	NA	NA	NA		
6	Anthracene	NA	NA	NA	NA		
7	Benzene	0E+00	0E+00	0E+00	0E+00		
8	Benzo(a)anthra	0E+00	NA	4E-07	NA		
9	Benzo(a)pyrene	0E+00	NA	0E+00	NA		
10	Benzo(b)fluora	0E+00	NA	4E-07	NA		
11	Benzo(g,h,i)pe	NA	NA	NA	NA		
12	Benzo(k)fluora	0E+00	NA	4E-07	NA		
13	Beta-endosulfa	NA	NA	NA	NA		
14	Boron	NA	NA	NA	NA		
15	Cadmium (food	NA	NA	NA	NA		
16	Cadmium (wate	NA	NA	NA	NA		
17	Chlordane	0E+00	0E+00	0E+00	0E+00		
18	Chromium (VI)	NA	NA	NA	NA		
19	Chrysene	0E+00	NA	4E-07	NA		
20	Cyanide (free)	NA	NA	NA	NA		
21	DDD, 4,4'-	0E+00	0E+00	4E-10	2E-10		
22	DDE, 4,4'-	0E+00	0E+00	4E-10	2E-10		
23	DDT, 4,4'-	0E+00	0E+00	8E-10	4E-10		
24	Dibenz(a,h)ant	0E+00	NA	0E+00	NA		
25	Dieldrin	0E+00	0E+00	2E-09	1E-09		
26	Dimethylbenzen	NA	NA	NA	NA		
27	Endrin	NA	NA	NA	NA		
28	Fluoranthene	NA	NA	NA	NA		
29	Fluorene	NA	NA	NA	NA		
30	Gamma-chlordan	0E+00	0E+00	0E+00	0E+00		
31	Gamma-hexachlo	2E-11	9E-10	0E+00	0E+00		
32	Heptachlor	0E+00	0E+00	0E+00	0E+00		
33	Heptachlor epo	0E+00	0E+00	6E-10	4E-10		
34	Indeno(1,2,3-c	0E+00	NA	7E-07	NA		
35	Lead	NA	NA	NA	NA		
36	Mercury, inorg	NA	NA	NA	NA		
37	Naphthalene	NA	NA	NA	NA		
38	Nickel	NA	NA	NA	NA		
39	Nitrate	NA	NA	NA	NA		
40	Nitrite	NA	NA	NA	NA		
41	PCB 1260	0E+00	0E+00	0E+00	0E+00		
42	Phenanthrene	NA	NA	NA	NA		
43	Pyrene	NA	NA	NA	NA		
44	Silver	NA	NA	NA	NA		
45	Sulfide	NA	NA	NA	NA		
46	Tetrachloroeth	0E+00	0E+00	0E+00	0E+00		
47	Tetrazene	NA	NA	NA	NA		

48 Toluene	1.3E-08	4.1E-06	0.0E+00	0.0E+00	NA	NA	NA	NA		
49 Trichloroethen	9.6E-09	6.7E-07	0.0E+00	0.0E+00	1E-10	7E-09	0E+00	0E+00		
50 Uranium (solub	0.0E+00	0.0E+00	0.0E+00	0.0E+00	NA	NA	NA	NA		
51 Xylenes (total	8.6E-09	2.3E-07	0.0E+00	0.0E+00	NA	NA	NA	NA		
TOTAL PATHWAY CANCER RISK					1E-10	8E-09	2E-06	5E-09	0E+00	0E+00
POPULATION TOTAL EXCESS RISK					2E-06					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: PARK ANGLER

EXPOSURE POINT: RIVER PARK
MEDIUM: FISH
ROUTE: ORAL

HIFs = 0.0E+00
HIFc = 1.9E-04
HIFl = 5.9E-05

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP3
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene		0.0E+00		0.0E+00		ERR	0.0E+00	1.9E-04	1	0.0E+00	6.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
2	Acenaphthylene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
3	Aldrin							0.0E+00	1.9E-04	1	0.0E+00	3.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.7E+01	0E+00
4	Alpha-chlordane							0.0E+00	1.9E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.3E+00	0E+00
5	Alpha-endosulfan							0.0E+00	1.9E-04	1	0.0E+00	5.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
6	Anthracene							0.0E+00	1.9E-04	1	0.0E+00	3.0E-01	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
7	Benzene							0.0E+00	1.9E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	5.9E-05	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthracene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
9	Benzo(a)pyrene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
10	Benzo(b)fluoranthene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
11	Benzo(g,h,i)perylene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
12	Benzo(k)fluoranthene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
13	Beta-endosulfan							0.0E+00	1.9E-04	1	0.0E+00	5.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
14	Boron							0.0E+00	1.9E-04	1	0.0E+00	9.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
15	Cadmium (food,soil)							0.0E+00	1.9E-04	1	0.0E+00	1.0E-03	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
16	Cadmium (water)							0.0E+00	1.9E-04	1	0.0E+00	5.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
17	Chlordane							0.0E+00	1.9E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.3E+00	0E+00
18	Chromium (VI)							1.5E-01	1.9E-04	1	2.9E-05	5.0E-03	6E-03	1.5E-01	5.9E-05	1	9.1E-06	NA	NA
19	Chrysene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
20	Cyanide (free)							0.0E+00	1.9E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
21	DDD, 4,4'-							0.0E+00	1.9E-04	1	0.0E+00	NA	NA	0.0E+00	5.9E-05	1	0.0E+00	2.4E-01	0E+00
22	DDE, 4,4'-							0.0E+00	1.9E-04	1	0.0E+00	NA	NA	0.0E+00	5.9E-05	1	0.0E+00	3.4E-01	0E+00
23	DDT, 4,4'-							0.0E+00	1.9E-04	1	0.0E+00	5.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	3.4E-01	0E+00
24	Dibenz(a,h)anthracene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin							0.0E+00	1.9E-04	1	0.0E+00	5.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.6E+01	0E+00
26	Dimethylbenzene, 1,3-							1.8E-02	1.9E-04	1	3.5E-06	2.0E+00	2E-06	1.8E-02	5.9E-05	1	1.1E-06	NA	NA
27	Endrin							0.0E+00	1.9E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
28	Fluoranthene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
29	Fluorene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
30	Gamma-chlordane							0.0E+00	1.9E-04	1	0.0E+00	6.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.3E+00	0E+00
31	Gamma-hexachlorohexane							0.0E+00	1.9E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor							0.0E+00	1.9E-04	1	0.0E+00	5.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epoxide							0.0E+00	1.9E-04	1	0.0E+00	1.3E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	9.1E+00	0E+00
34	Indeno(1,2,3-cd)pyrene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.3E+00	0E+00
35	Lead							0.0E+00	1.9E-04	1	0.0E+00	NA	NA	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
36	Mercury, inorganic							0.0E+00	1.9E-04	1	0.0E+00	3.0E-04	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
37	Naphthalene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
38	Nickel							0.0E+00	1.9E-04	1	0.0E+00	2.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
39	Nitrate							0.0E+00	1.9E-04	1	0.0E+00	1.6E+00	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
40	Nitrite							0.0E+00	1.9E-04	1	0.0E+00	1.0E-01	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
41	PCB 1260							0.0E+00	1.9E-04	1	0.0E+00	7.0E-05	0E+00	0.0E+00	5.9E-05	1	0.0E+00	7.7E+00	0E+00
42	Phenanthrene							0.0E+00	1.9E-04	1	0.0E+00	4.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
43	Pyrene							0.0E+00	1.9E-04	1	0.0E+00	3.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
44	Silver							0.0E+00	1.9E-04	1	0.0E+00	5.0E-03	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA

45	Sulfide	0.0E+00	1.9E-04	1	0.0E+00	NA	NA	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
46	Tetrachloroethene	0.0E+00	1.9E-04	1	0.0E+00	1.0E-02	0E+00	0.0E+00	5.9E-05	1	0.0E+00	5.2E-02	0E+00
47	Tetrazene	0.0E+00	1.9E-04	1	0.0E+00	NA	NA	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
48	Toluene	1.5E-01	1.9E-04	1	2.8E-05	2.0E-01	1E-04	1.5E-01	5.9E-05	1	8.8E-06	NA	NA
49	Trichloroethene	7.8E-02	1.9E-04	1	1.5E-05	2.0E-03	7E-03	7.8E-02	5.9E-05	1	4.6E-06	1.1E-02	5E-08
50	Uranium (soluble salts)	0.0E+00	1.9E-04	1	0.0E+00	3.0E-03	0E+00	0.0E+00	5.9E-05	1	0.0E+00	NA	NA
51	Xylenes (total)	3.1E-02	1.9E-04	1	6.0E-06	2.0E+00	3E-06	3.1E-02	5.9E-05	1	1.8E-06	NA	NA

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP3
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY | CHRONIC RISK SUMMARY

FUTURE
PARK ANGLER

		CHRONIC DAILY INTAKE (mg/kg/day)						CHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		RIVER PARK	0	0	0	0	0	RIVER PARK	0	0	0	0	0
		FISH	0	0	0	0	0	FISH	0	0	0	0	0
		ORAL	0	0	0	0	0	ORAL	0	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0.0E+00						0E+00					
3	Aldrin	0.0E+00						0E+00					
4	Alpha-chlordan	0.0E+00						0E+00					
5	Alpha-endosulf	0.0E+00						0E+00					
6	Anthracene	0.0E+00						0E+00					
7	Benzene	0.0E+00						0E+00					
8	Benzo(a)anthra	0.0E+00						0E+00					
9	Benzo(a)pyrene	0.0E+00						0E+00					
10	Benzo(b)fluora	0.0E+00						0E+00					
11	Benzo(g,h,i)pe	0.0E+00						0E+00					
12	Benzo(k)fluora	0.0E+00						0E+00					
13	Beta-endosulfa	0.0E+00						0E+00					
14	Boron	0.0E+00						0E+00					
15	Cadmium (food	0.0E+00						0E+00					
16	Cadmium (wate	0.0E+00						0E+00					
17	Chlordane	0.0E+00						0E+00					
18	Chromium (VI)	2.9E-05						6E-03					
19	Chrysene	0.0E+00						0E+00					
20	Cyanide (free)	0.0E+00						0E+00					
21	DDD, 4,4'-	0.0E+00						NA					
22	DDE, 4,4'-	0.0E+00						NA					
23	DDT, 4,4'-	0.0E+00						0E+00					
24	Dibenz(a,h)ant	0.0E+00						0E+00					
25	Dieldrin	0.0E+00						0E+00					
26	Dimethylbenzen	3.5E-06						2E-06					
27	Endrin	0.0E+00						0E+00					
28	Fluoranthene	0.0E+00						0E+00					
29	Fluorene	0.0E+00						0E+00					
30	Gamma-chlordan	0.0E+00						0E+00					
31	Gamma-hexachlo	0.0E+00						0E+00					
32	Heptachlor	0.0E+00						0E+00					
33	Heptachlor epo	0.0E+00						0E+00					
34	Indeno(1,2,3-c	0.0E+00						0E+00					
35	Lead	0.0E+00						NA					
36	Mercury, inorg	0.0E+00						0E+00					
37	Naphthalene	0.0E+00						0E+00					
38	Nickel	0.0E+00						0E+00					
39	Nitrate	0.0E+00						0E+00					
40	Nitrite	0.0E+00						0E+00					
41	PCB 1260	0.0E+00						0E+00					
42	Phenanthrene	0.0E+00						0E+00					
43	Pyrene	0.0E+00						0E+00					
44	Silver	0.0E+00						0E+00					
45	Sulfide	0.0E+00						NA					
46	Tetrachloroeth	0.0E+00						0E+00					
47	Tetrazene	0.0E+00						NA					

48 Toluene	2.8E-05	1E-04					
49 Trichloroethen	1.5E-05	7E-03					
50 Uranium (solub	0.0E+00	0E+00					
51 Xylenes (total	6.0E-06	3E-06					
PATHWAY SUM (HI)		1E-02	0E+00	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL		1E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP3
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
PARK ANGLER

	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day)					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	RIVER PARK	0	0	0	0	0
	FISH	0	0	0	0	0
	ORAL	0	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2 Acenaphthylene	0.0E+00					
3 Aldrin	0.0E+00					
4 Alpha-chlordan	0.0E+00					
5 Alpha-endosulf	0.0E+00					
6 Anthracene	0.0E+00					
7 Benzene	0.0E+00					
8 Benzo(a)anthra	0.0E+00					
9 Benzo(a)pyrene	0.0E+00					
10 Benzo(b)fluora	0.0E+00					
11 Benzo(g,h,i)pe	0.0E+00					
12 Benzo(k)fluora	0.0E+00					
13 Beta-endosulfa	0.0E+00					
14 Boron	0.0E+00					
15 Cadmium (food	0.0E+00					
16 Cadmium (wate	0.0E+00					
17 Chlordane	0.0E+00					
18 Chromium (VI)	9.1E-06					
19 Chrysene	0.0E+00					
20 Cyanide (free)	0.0E+00					
21 DDD, 4,4'-	0.0E+00					
22 DDE, 4,4'-	0.0E+00					
23 DDT, 4,4'-	0.0E+00					
24 Dibenz(a,h)ant	0.0E+00					
25 Dieldrin	0.0E+00					
26 Dimethylbenzen	1.1E-06					
27 Endrin	0.0E+00					
28 Fluoranthene	0.0E+00					
29 Fluorene	0.0E+00					
30 Gamma-chlordan	0.0E+00					
31 Gamma-hexachlo	0.0E+00					
32 Heptachlor	0.0E+00					
33 Heptachlor epo	0.0E+00					
34 Indeno(1,2,3-c	0.0E+00					
35 Lead	0.0E+00					
36 Mercury, inorg	0.0E+00					
37 Naphthalene	0.0E+00					
38 Nickel	0.0E+00					
39 Nitrate	0.0E+00					
40 Nitrite	0.0E+00					
41 PCB 1260	0.0E+00					
42 Phenanthrene	0.0E+00					
43 Pyrene	0.0E+00					
44 Silver	0.0E+00					
45 Sulfide	0.0E+00					
46 Tetrachloroeth	0.0E+00					
47 Tetrazene	0.0E+00					

LIFETIME RISK SUMMARY

FUTURE
PARK ANGLER

	LIFETIME EXCESS CANCER RISK					
	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
	RIVER PARK	0	0	0	0	0
	FISH	0	0	0	0	0
	ORAL	0	0	0	0	0
CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1 Acenaphthene	NA	0E+00	0E+00	0E+00	0E+00	0E+00
2 Acenaphthylene	NA					
3 Aldrin	0E+00					
4 Alpha-chlordan	0E+00					
5 Alpha-endosulf	NA					
6 Anthracene	NA					
7 Benzene	0E+00					
8 Benzo(a)anthra	0E+00					
9 Benzo(a)pyrene	0E+00					
10 Benzo(b)fluora	0E+00					
11 Benzo(g,h,i)pe	NA					
12 Benzo(k)fluora	0E+00					
13 Beta-endosulfa	NA					
14 Boron	NA					
15 Cadmium (food	NA					
16 Cadmium (wate	NA					
17 Chlordane	0E+00					
18 Chromium (VI)	NA					
19 Chrysene	0E+00					
20 Cyanide (free)	NA					
21 DDD, 4,4'-	0E+00					
22 DDE, 4,4'-	0E+00					
23 DDT, 4,4'-	0E+00					
24 Dibenz(a,h)ant	0E+00					
25 Dieldrin	0E+00					
26 Dimethylbenzen	NA					
27 Endrin	NA					
28 Fluoranthene	NA					
29 Fluorene	NA					
30 Gamma-chlordan	0E+00					
31 Gamma-hexachlo	0E+00					
32 Heptachlor	0E+00					
33 Heptachlor epo	0E+00					
34 Indeno(1,2,3-c	0E+00					
35 Lead	NA					
36 Mercury, inorg	NA					
37 Naphthalene	NA					
38 Nickel	NA					
39 Nitrate	NA					
40 Nitrite	NA					
41 PCB 1260	0E+00					
42 Phenanthrene	NA					
43 Pyrene	NA					
44 Silver	NA					
45 Sulfide	NA					
46 Tetrachloroeth	0E+00					
47 Tetrazene	NA					

48 Toluene	8.8E-06	NA					
49 Trichloroethen	4.6E-06	5E-08					
50 Uranium (solub	0.0E+00	NA					
51 Xylenes (total	1.8E-06	NA					
TOTAL PATHWAY CANCER RISK		5E-08	0E+00	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK		5E-08					

RANGE NAME: WS1

EXPOSURE AND RISK CALCULATION WORKSHEET

LAND USE: FUTURE
POPULATION: ZONE 4 VISITOR

EXPOSURE POINT: ZONE 4-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: ORAL

HIFs = 1.5E-06
HIFc = 8.5E-07
HIFl = 1.3E-07

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP4
LAST UPDATED: 08/18/93

		SUBCHRONIC						CHRONIC						LIFETIME					
	CHEMICAL NAME	Cs	HIFs	1	DIs	RfDS	HQs	Cc	HIFc	1	DIc	RfDC	HQc	Cl	HIFl	1	DIl	SF	RISK
1	Acenaphthene	7.2E-02	1.5E-06	1	1.1E-07	6.0E-01	2E-07	7.2E-02	8.5E-07	1	6.1E-08	6.0E-02	1E-06	7.2E-02	1.3E-07	1	9.4E-09	NA	NA
2	Acenaphthylene	0.0E+00	1.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
3	Aldrin	7.6E-03	1.5E-06	1	1.1E-08	3.0E-05	4E-04	7.6E-03	8.5E-07	1	6.5E-09	3.0E-05	2E-04	7.6E-03	1.3E-07	1	9.9E-10	1.7E+01	2E-08
4	Alpha-chlordan	2.9E-02	1.5E-06	1	4.4E-08	6.0E-05	7E-04	2.9E-02	8.5E-07	1	2.5E-08	6.0E-05	4E-04	2.9E-02	1.3E-07	1	3.8E-09	1.3E+00	5E-09
5	Alpha-endosulf	6.8E-03	1.5E-06	1	1.0E-08	2.0E-04	5E-05	6.8E-03	8.5E-07	1	5.8E-09	5.0E-05	1E-04	6.8E-03	1.3E-07	1	8.9E-10	NA	NA
6	Anthracene	0.0E+00	1.5E-06	1	0.0E+00	3.0E+00	0E+00	0.0E+00	8.5E-07	1	0.0E+00	3.0E-01	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
7	Benzene	0.0E+00	1.5E-06	1	0.0E+00	5.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.3E-07	1	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.6E-01	1.5E-06	1	5.4E-07	4.0E-02	1E-05	3.6E-01	8.5E-07	1	3.0E-07	4.0E-02	8E-06	3.6E-01	1.3E-07	1	4.6E-08	7.3E+00	3E-07
9	Benzo(a)pyrene	5.8E-01	1.5E-06	1	8.7E-07	4.0E-02	2E-05	5.8E-01	8.5E-07	1	4.9E-07	4.0E-02	1E-05	5.8E-01	1.3E-07	1	7.6E-08	7.3E+00	6E-07
10	Benzo(b)fluora	5.8E-01	1.5E-06	1	8.7E-07	4.0E-02	2E-05	5.8E-01	8.5E-07	1	4.9E-07	4.0E-02	1E-05	5.8E-01	1.3E-07	1	7.5E-08	7.3E+00	6E-07
11	Benzo(g,h,i)pe	4.4E-01	1.5E-06	1	6.6E-07	4.0E-02	2E-05	4.4E-01	8.5E-07	1	3.7E-07	4.0E-02	9E-06	4.4E-01	1.3E-07	1	5.7E-08	NA	NA
12	Benzo(k)fluora	5.1E-01	1.5E-06	1	7.7E-07	4.0E-02	2E-05	5.1E-01	8.5E-07	1	4.4E-07	4.0E-02	1E-05	5.1E-01	1.3E-07	1	6.7E-08	7.3E+00	5E-07
13	Beta-endosulfa	6.3E-03	1.5E-06	1	9.4E-09	2.0E-04	5E-05	6.3E-03	8.5E-07	1	5.3E-09	5.0E-05	1E-04	6.3E-03	1.3E-07	1	8.1E-10	NA	NA
14	Boron	1.1E+01	1.5E-06	1	1.6E-05	9.0E-02	2E-04	1.1E+01	8.5E-07	1	9.0E-06	9.0E-02	1E-04	1.1E+01	1.3E-07	1	1.4E-06	NA	NA
15	Cadmium (food	7.9E-01	1.5E-06	1	1.2E-06	NA	NA	7.9E-01	8.5E-07	1	6.8E-07	1.0E-03	7E-04	7.9E-01	1.3E-07	1	1.0E-07	NA	NA
16	Cadmium (wate	--	1.5E-06	1	0.0E+00	NA	NA	--	8.5E-07	1	0.0E+00	5.0E-04	0E+00	--	1.3E-07	1	0.0E+00	NA	NA
17	Chlordane	1.5E+00	1.5E-06	1	2.2E-06	6.0E-05	4E-02	1.5E+00	8.5E-07	1	1.3E-06	6.0E-05	2E-02	1.5E+00	1.3E-07	1	1.9E-07	1.3E+00	3E-07
18	Chromium (VI)	0.0E+00	1.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	5.0E-03	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
19	Chrysene	6.9E-01	1.5E-06	1	1.0E-06	4.0E-02	3E-05	6.9E-01	8.5E-07	1	5.9E-07	4.0E-02	1E-05	6.9E-01	1.3E-07	1	9.0E-08	7.3E+00	7E-07
20	Cyanide (free)	3.2E-01	1.5E-06	1	4.8E-07	2.0E-02	2E-05	3.2E-01	8.5E-07	1	2.7E-07	2.0E-02	1E-05	3.2E-01	1.3E-07	1	4.1E-08	NA	NA
21	DDD, 4,4'-	1.9E-01	1.5E-06	1	2.8E-07	NA	NA	1.9E-01	8.5E-07	1	1.6E-07	NA	NA	1.9E-01	1.3E-07	1	2.4E-08	2.4E-01	6E-09
22	DDE, 4,4'-	3.6E-01	1.5E-06	1	5.4E-07	NA	NA	3.6E-01	8.5E-07	1	3.1E-07	NA	NA	3.6E-01	1.3E-07	1	4.7E-08	3.4E-01	2E-08
23	DDT, 4,4'-	9.4E-01	1.5E-06	1	1.4E-06	5.0E-04	3E-03	9.4E-01	8.5E-07	1	8.0E-07	5.0E-04	2E-03	9.4E-01	1.3E-07	1	1.2E-07	3.4E-01	4E-08
24	Dibenz(a,h)ant	0.0E+00	1.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.3E-07	1	0.0E+00	7.3E+00	0E+00
25	Dieldrin	3.5E-02	1.5E-06	1	5.2E-08	5.0E-05	1E-03	3.5E-02	8.5E-07	1	2.9E-08	5.0E-05	6E-04	3.5E-02	1.3E-07	1	4.5E-09	1.6E+01	7E-08
26	Dimethylbenzen	0.0E+00	1.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	8.5E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
27	Endrin	3.8E-01	1.5E-06	1	5.7E-07	3.0E-04	2E-03	3.8E-01	8.5E-07	1	3.2E-07	3.0E-04	1E-03	3.8E-01	1.3E-07	1	4.9E-08	NA	NA
28	Fluoranthene	6.4E-01	1.5E-06	1	9.6E-07	4.0E-01	2E-06	6.4E-01	8.5E-07	1	5.4E-07	4.0E-02	1E-05	6.4E-01	1.3E-07	1	8.3E-08	NA	NA
29	Fluorene	0.0E+00	1.5E-06	1	0.0E+00	4.0E-01	0E+00	0.0E+00	8.5E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
30	Gamma-chlordan	3.2E-02	1.5E-06	1	4.7E-08	6.0E-05	8E-04	3.2E-02	8.5E-07	1	2.7E-08	6.0E-05	4E-04	3.2E-02	1.3E-07	1	4.1E-09	1.3E+00	5E-09
31	Gamma-hexachlo	0.0E+00	1.5E-06	1	0.0E+00	3.0E-03	0E+00	0.0E+00	8.5E-07	1	0.0E+00	3.0E-04	0E+00	0.0E+00	1.3E-07	1	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	1.5E-06	1	0.0E+00	5.0E-04	0E+00	0.0E+00	8.5E-07	1	0.0E+00	5.0E-04	0E+00	0.0E+00	1.3E-07	1	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	8.8E-02	1.5E-06	1	1.3E-07	1.3E-05	1E-02	8.8E-02	8.5E-07	1	7.5E-08	1.3E-05	6E-03	8.8E-02	1.3E-07	1	1.1E-08	9.1E+00	1E-07
34	Indeno(1,2,3-c	3.2E-01	1.5E-06	1	4.8E-07	4.0E-02	1E-05	3.2E-01	8.5E-07	1	2.7E-07	4.0E-02	7E-06	3.2E-01	1.3E-07	1	4.2E-08	7.3E+00	3E-07
35	Lead	2.5E+02	1.5E-06	1	3.8E-04	NA	NA	2.5E+02	8.5E-07	1	2.1E-04	NA	NA	2.5E+02	1.3E-07	1	3.3E-05	NA	NA
36	Mercury, inorg	2.4E-01	1.5E-06	1	3.6E-07	3.0E-04	1E-03	2.4E-01	8.5E-07	1	2.1E-07	3.0E-04	7E-04	2.4E-01	1.3E-07	1	3.2E-08	NA	NA
37	Naphthalene	0.0E+00	1.5E-06	1	0.0E+00	4.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	4.0E-02	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
38	Nickel	2.1E+01	1.5E-06	1	3.1E-05	2.0E-02	2E-03	2.1E+01	8.5E-07	1	1.8E-05	2.0E-02	9E-04	2.1E+01	1.3E-07	1	2.7E-06	NA	NA
39	Nitrate	--	1.5E-06	1	0.0E+00	1.6E+00	0E+00	--	8.5E-07	1	0.0E+00	1.6E+00	0E+00	--	1.3E-07	1	0.0E+00	NA	NA
40	Nitrite	5.7E+00	1.5E-06	1	8.5E-06	1.0E-01	8E-05	5.7E+00	8.5E-07	1	4.8E-06	1.0E-01	5E-05	5.7E+00	1.3E-07	1	7.4E-07	NA	NA
41	PCB 1260	6.1E-01	1.5E-06	1	9.2E-07	7.0E-05	1E-02	6.1E-01	8.5E-07	1	5.2E-07	7.0E-05	7E-03	6.1E-01	1.3E-07	1	8.0E-08	7.7E+00	6E-07
42	Phenanthrene	6.0E-01	1.5E-06	1	9.0E-07	4.0E-02	2E-05	6.0E-01	8.5E-07	1	5.1E-07	4.0E-02	1E-05	6.0E-01	1.3E-07	1	7.8E-08	NA	NA
43	Pyrene	9.7E-01	1.5E-06	1	1.5E-06	3.0E-01	5E-06	9.7E-01	8.5E-07	1	8.3E-07	3.0E-02	3E-05	9.7E-01	1.3E-07	1	1.3E-07	NA	NA
44	Silver	5.5E-02	1.5E-06	1	8.3E-08	5.0E-03	2E-05	5.5E-02	8.5E-07	1	4.7E-08	5.0E-03	9E-06	5.5E-02	1.3E-07	1	7.2E-09	NA	NA

45	Sulfide	2.6E+02	1.5E-06	1	4.0E-04	NA	NA	2.6E+02	8.5E-07	1	2.2E-04	NA	NA	2.6E+02	1.3E-07	1	3.4E-05	NA	NA
46	Tetrachloroeth	0.0E+00	1.5E-06	1	0.0E+00	1.0E-01	0E+00	0.0E+00	8.5E-07	1	0.0E+00	1.0E-02	0E+00	0.0E+00	1.3E-07	1	0.0E+00	5.2E-02	0E+00
47	Tetrazene	--	1.5E-06	1	0.0E+00	NA	NA	--	8.5E-07	1	0.0E+00	NA	NA	--	1.3E-07	1	0.0E+00	NA	NA
48	Toluene	0.0E+00	1.5E-06	1	0.0E+00	2.0E+00	0E+00	0.0E+00	8.5E-07	1	0.0E+00	2.0E-01	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	1.5E-06	1	0.0E+00	2.0E-02	0E+00	0.0E+00	8.5E-07	1	0.0E+00	2.0E-03	0E+00	0.0E+00	1.3E-07	1	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	0.0E+00	1.5E-06	1	0.0E+00	NA	NA	0.0E+00	8.5E-07	1	0.0E+00	3.0E-03	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	1.5E-06	1	0.0E+00	4.0E+00	0E+00	0.0E+00	8.5E-07	1	0.0E+00	2.0E+00	0E+00	0.0E+00	1.3E-07	1	0.0E+00	NA	NA

RANGE NAME: WS2

EXPOSURE AND RISK CALCULATION WORKSHEET

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP4
LAST UPDATED: 08/18/93

LAND USE: FUTURE
POPULATION: ZONE 4 VISITOR

EXPOSURE POINT: ZONE 4-NON EXC
MEDIUM: SOIL (0-2')
ROUTE: DERMAL

HIFs = 1.9E-05
HIFc = 1.7E-05
HIFl = 4.5E-06

	CHEMICAL NAME	SUBCHRONIC						CHRONIC						LIFETIME					
		Cs	HIFs	ABS	DIs	RfDS	HQs	Cc	HIFc	ABS	DIc	RfDC	HQc	Cl	HIFl	ABS	DIl	SF	RISK
1	Acenaphthene	7.2E-02	1.9E-05	NA	NA	NA	NA	7.2E-02	1.7E-05	NA	NA	NA	NA	7.2E-02	4.5E-06	NA	NA	NA	NA
2	Acenaphthylene	0.0E+00	1.9E-05	NA	NA	NA	NA	0.0E+00	1.7E-05	NA	NA	NA	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
3	Aldrin	7.6E-03	1.9E-05	1.0E-02	1.4E-09	3.0E-05	5E-05	7.6E-03	1.7E-05	1.0E-02	1.3E-09	3.0E-05	4E-05	7.6E-03	4.5E-06	1.0E-02	3.4E-10	1.7E+01	6E-09
4	Alpha-chlordan	2.9E-02	1.9E-05	1.0E-02	5.5E-09	4.8E-05	1E-04	2.9E-02	1.7E-05	1.0E-02	4.9E-09	4.8E-05	1E-04	2.9E-02	4.5E-06	1.0E-02	1.3E-09	1.6E+00	2E-09
5	Alpha-endosulf	6.8E-03	1.9E-05	1.0E-02	1.3E-09	2.0E-04	6E-06	6.8E-03	1.7E-05	1.0E-02	1.2E-09	5.0E-05	2E-05	6.8E-03	4.5E-06	1.0E-02	3.1E-10	NA	NA
6	Anthracene	0.0E+00	1.9E-05	NA	NA	NA	NA	0.0E+00	1.7E-05	NA	NA	NA	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
7	Benzene	0.0E+00	1.9E-05	8.0E-02	0.0E+00	5.0E-02	0E+00	0.0E+00	1.7E-05	8.0E-02	0.0E+00	5.0E-03	0E+00	0.0E+00	4.5E-06	8.0E-02	0.0E+00	2.9E-02	0E+00
8	Benzo(a)anthra	3.6E-01	1.9E-05	NA	NA	NA	NA	3.6E-01	1.7E-05	NA	NA	NA	NA	3.6E-01	4.5E-06	NA	NA	NA	NA
9	Benzo(a)pyrene	5.8E-01	1.9E-05	NA	NA	NA	NA	5.8E-01	1.7E-05	NA	NA	NA	NA	5.8E-01	4.5E-06	NA	NA	NA	NA
10	Benzo(b)fluora	5.8E-01	1.9E-05	NA	NA	NA	NA	5.8E-01	1.7E-05	NA	NA	NA	NA	5.8E-01	4.5E-06	NA	NA	NA	NA
11	Benzo(g,h,i)pe	4.4E-01	1.9E-05	NA	NA	NA	NA	4.4E-01	1.7E-05	NA	NA	NA	NA	4.4E-01	4.5E-06	NA	NA	NA	NA
12	Benzo(k)fluora	5.1E-01	1.9E-05	NA	NA	NA	NA	5.1E-01	1.7E-05	NA	NA	NA	NA	5.1E-01	4.5E-06	NA	NA	NA	NA
13	Beta-endosulfa	6.3E-03	1.9E-05	1.0E-02	1.2E-09	2.0E-04	6E-06	6.3E-03	1.7E-05	1.0E-02	1.1E-09	5.0E-05	2E-05	6.3E-03	4.5E-06	1.0E-02	2.8E-10	NA	NA
14	Boron	1.1E+01	1.9E-05	1.0E-03	2.0E-07	9.0E-02	2E-06	1.1E+01	1.7E-05	1.0E-03	1.8E-07	9.0E-02	2E-06	1.1E+01	4.5E-06	1.0E-03	4.8E-08	NA	NA
15	Cadmium (food	7.9E-01	1.9E-05	1.0E-02	1.5E-07	NA	NA	7.9E-01	1.7E-05	1.0E-02	1.4E-07	2.5E-05	5E-03	7.9E-01	4.5E-06	1.0E-02	3.6E-08	NA	NA
16	Cadmium (wate	--	1.9E-05	NA	NA	NA	NA	--	1.7E-05	NA	NA	2.5E-05	NA	--	4.5E-06	NA	NA	NA	NA
17	Chlordane	1.5E+00	1.9E-05	1.0E-02	2.8E-07	6.0E-05	5E-03	1.5E+00	1.7E-05	1.0E-02	2.5E-07	6.0E-05	4E-03	1.5E+00	4.5E-06	1.0E-02	6.7E-08	1.3E+00	9E-08
18	Chromium (VI)	0.0E+00	1.9E-05	NA	NA	1.0E-03	NA	0.0E+00	1.7E-05	NA	NA	2.5E-04	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
19	Chrysene	6.9E-01	1.9E-05	NA	NA	NA	NA	6.9E-01	1.7E-05	NA	NA	NA	NA	6.9E-01	4.5E-06	NA	NA	NA	NA
20	Cyanide (free)	3.2E-01	1.9E-05	3.0E-02	1.8E-07	2.0E-02	9E-06	3.2E-01	1.7E-05	3.0E-02	1.6E-07	2.0E-02	8E-06	3.2E-01	4.5E-06	3.0E-02	4.3E-08	NA	NA
21	DDD, 4,4'-	1.9E-01	1.9E-05	1.0E-02	3.6E-08	NA	NA	1.9E-01	1.7E-05	1.0E-02	3.2E-08	NA	NA	1.9E-01	4.5E-06	1.0E-02	8.5E-09	2.4E-01	2E-09
22	DDE, 4,4'-	3.6E-01	1.9E-05	1.0E-02	6.9E-08	NA	NA	3.6E-01	1.7E-05	1.0E-02	6.1E-08	NA	NA	3.6E-01	4.5E-06	1.0E-02	1.6E-08	3.4E-01	6E-09
23	DDT, 4,4'-	9.4E-01	1.9E-05	1.0E-02	1.8E-07	5.0E-04	4E-04	9.4E-01	1.7E-05	1.0E-02	1.6E-07	5.0E-04	3E-04	9.4E-01	4.5E-06	1.0E-02	4.2E-08	3.4E-01	1E-08
24	Dibenz(a,h)ant	0.0E+00	1.9E-05	NA	NA	NA	NA	0.0E+00	1.7E-05	NA	NA	NA	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
25	Dieldrin	3.5E-02	1.9E-05	1.0E-02	6.6E-09	5.0E-05	1E-04	3.5E-02	1.7E-05	1.0E-02	5.9E-09	5.0E-05	1E-04	3.5E-02	4.5E-06	1.0E-02	1.6E-09	1.6E+01	2E-08
26	Dimethylbenzen	0.0E+00	1.9E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	1.7E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	4.5E-06	1.2E-01	0.0E+00	NA	NA
27	Endrin	3.8E-01	1.9E-05	1.0E-02	7.2E-08	3.0E-04	2E-04	3.8E-01	1.7E-05	1.0E-02	6.5E-08	3.0E-04	2E-04	3.8E-01	4.5E-06	1.0E-02	1.7E-08	NA	NA
28	Fluoranthene	6.4E-01	1.9E-05	NA	NA	NA	NA	6.4E-01	1.7E-05	NA	NA	NA	NA	6.4E-01	4.5E-06	NA	NA	NA	NA
29	Fluorene	0.0E+00	1.9E-05	NA	NA	NA	NA	0.0E+00	1.7E-05	NA	NA	NA	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
30	Gamma-chlordan	3.2E-02	1.9E-05	1.0E-02	6.0E-09	4.8E-05	1E-04	3.2E-02	1.7E-05	1.0E-02	5.4E-09	4.8E-05	1E-04	3.2E-02	4.5E-06	1.0E-02	1.4E-09	1.6E+00	2E-09
31	Gamma-hexachlo	0.0E+00	1.9E-05	1.0E-02	0.0E+00	3.0E-03	0E+00	0.0E+00	1.7E-05	1.0E-02	0.0E+00	3.0E-04	0E+00	0.0E+00	4.5E-06	1.0E-02	0.0E+00	1.3E+00	0E+00
32	Heptachlor	0.0E+00	1.9E-05	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	1.7E-05	1.0E-02	0.0E+00	5.0E-04	0E+00	0.0E+00	4.5E-06	1.0E-02	0.0E+00	4.5E+00	0E+00
33	Heptachlor epo	8.8E-02	1.9E-05	1.0E-02	1.7E-08	1.3E-05	1E-03	8.8E-02	1.7E-05	1.0E-02	1.5E-08	1.3E-05	1E-03	8.8E-02	4.5E-06	1.0E-02	4.0E-09	9.1E+00	4E-08
34	Indeno(1,2,3-c	3.2E-01	1.9E-05	NA	NA	NA	NA	3.2E-01	1.7E-05	NA	NA	NA	NA	3.2E-01	4.5E-06	NA	NA	NA	NA
35	Lead	2.5E+02	1.9E-05	6.0E-03	2.9E-05	NA	NA	2.5E+02	1.7E-05	6.0E-03	2.6E-05	NA	NA	2.5E+02	4.5E-06	6.0E-03	6.8E-06	NA	NA
36	Mercury, inorg	2.4E-01	1.9E-05	1.0E-03	4.6E-09	6.0E-06	8E-04	2.4E-01	1.7E-05	1.0E-03	4.1E-09	6.0E-06	7E-04	2.4E-01	4.5E-06	1.0E-03	1.1E-09	NA	NA
37	Naphthalene	0.0E+00	1.9E-05	NA	NA	NA	NA	0.0E+00	1.7E-05	NA	NA	NA	NA	0.0E+00	4.5E-06	NA	NA	NA	NA
38	Nickel	2.1E+01	1.9E-05	NA	NA	1.0E-03	NA	2.1E+01	1.7E-05	NA	NA	1.0E-03	NA	2.1E+01	4.5E-06	NA	NA	NA	NA
39	Nitrate	--	1.9E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	1.7E-05	1.0E-03	0.0E+00	1.6E+00	0E+00	--	4.5E-06	1.0E-03	0.0E+00	NA	NA
40	Nitrite	5.7E+00	1.9E-05	1.0E-03	1.1E-07	1.0E-01	1E-06	5.7E+00	1.7E-05	1.0E-03	9.6E-08	1.0E-01	1E-06	5.7E+00	4.5E-06	1.0E-03	2.5E-08	NA	NA
41	PCB 1260	6.1E-01	1.9E-05	6.0E-02	7.0E-07	6.7E-05	1E-02	6.1E-01	1.7E-05	6.0E-02	6.2E-07	6.7E-05	9E-03	6.1E-01	4.5E-06	6.0E-02	1.7E-07	8.1E+00	1E-06
42	Phenanthrene	6.0E-01	1.9E-05	NA	NA	NA	NA	6.0E-01	1.7E-05	NA	NA	NA	NA	6.0E-01	4.5E-06	NA	NA	NA	NA
43	Pyrene	9.7E-01	1.9E-05	NA	NA	NA	NA	9.7E-01	1.7E-05	NA	NA	NA	NA	9.7E-01	4.5E-06	NA	NA	NA	NA
44	Silver	5.5E-02	1.9E-05	1.0E-02	1.0E-08	2.5E-04	4E-05	5.5E-02	1.7E-05	1.0E-02	9.4E-09	2.5E-04	4E-05	5.5E-02	4.5E-06	1.0E-02	2.5E-09	NA	NA

45	Sulfide	2.6E+02	1.9E-05	1.0E-03	5.0E-06	NA	NA	2.6E+02	1.7E-05	1.0E-03	4.5E-06	NA	NA	2.6E+02	4.5E-06	1.0E-03	1.2E-06	NA	NA
46	Tetrachloroeth	0.0E+00	1.9E-05	1.0E-01	0.0E+00	1.0E-01	0E+00	0.0E+00	1.7E-05	1.0E-01	0.0E+00	1.0E-02	0E+00	0.0E+00	4.5E-06	1.0E-01	0.0E+00	5.2E-02	0E+00
47	Tetrazene	--	1.9E-05	1.0E-02	0.0E+00	NA	NA	--	1.7E-05	1.0E-02	0.0E+00	NA	NA	--	4.5E-06	1.0E-02	0.0E+00	NA	NA
48	Toluene	0.0E+00	1.9E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	1.7E-05	1.2E-01	0.0E+00	2.0E-01	0E+00	0.0E+00	4.5E-06	1.2E-01	0.0E+00	NA	NA
49	Trichloroethen	0.0E+00	1.9E-05	1.0E-01	0.0E+00	2.0E-02	0E+00	0.0E+00	1.7E-05	1.0E-01	0.0E+00	2.0E-03	0E+00	0.0E+00	4.5E-06	1.0E-01	0.0E+00	1.1E-02	0E+00
50	Uranium (solub	0.0E+00	1.9E-05	1.0E-03	0.0E+00	NA	NA	0.0E+00	1.7E-05	1.0E-03	0.0E+00	1.5E-04	0E+00	0.0E+00	4.5E-06	1.0E-03	0.0E+00	NA	NA
51	Xylenes (total	0.0E+00	1.9E-05	1.2E-01	0.0E+00	4.0E+00	0E+00	0.0E+00	1.7E-05	1.2E-01	0.0E+00	2.0E+00	0E+00	0.0E+00	4.5E-06	1.2E-01	0.0E+00	NA	NA

RANGE NAME: SSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP4
LAST UPDATED: 08/18/93

SUBCHRONIC EXPOSURE SUMMARY

FUTURE
ZONE 4 VISITOR

	CHEMICAL NAME	SUBCHRONIC DAILY INTAKE (mg/kg/day) SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-NON	ZONE 4-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0
		(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1.1E-07	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	1.1E-08	1.4E-09				
4	Alpha-chlordan	4.4E-08	5.5E-09				
5	Alpha-endosulf	1.0E-08	1.3E-09				
6	Anthracene	0.0E+00	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	5.4E-07	NA				
9	Benzo(a)pyrene	8.7E-07	NA				
10	Benzo(b)fluora	8.7E-07	NA				
11	Benzo(g,h,i)pe	6.6E-07	NA				
12	Benzo(k)fluora	7.7E-07	NA				
13	Beta-endosulfa	9.4E-09	1.2E-09				
14	Boron	1.6E-05	2.0E-07				
15	Cadmium (food	1.2E-06	1.5E-07				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	2.2E-06	2.8E-07				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	1.0E-06	NA				
20	Cyanide (free)	4.8E-07	1.8E-07				
21	DDD, 4,4'-	2.8E-07	3.6E-08				
22	DDE, 4,4'-	5.4E-07	6.9E-08				
23	DDT, 4,4'-	1.4E-06	1.8E-07				
24	Dibenz(a,h)ant	0.0E+00	NA				
25	Dieldrin	5.2E-08	6.6E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	5.7E-07	7.2E-08				
28	Fluoranthene	9.6E-07	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	4.7E-08	6.0E-09				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	1.3E-07	1.7E-08				
34	Indeno(1,2,3-c	4.8E-07	NA				
35	Lead	3.8E-04	2.9E-05				
36	Mercury, inorg	3.6E-07	4.6E-09				
37	Naphthalene	0.0E+00	NA				
38	Nickel	3.1E-05	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	8.5E-06	1.1E-07				
41	PCB 1260	9.2E-07	7.0E-07				
42	Phenanthrene	9.0E-07	NA				
43	Pyrene	1.5E-06	NA				
44	Silver	8.3E-08	1.0E-08				
45	Sulfide	4.0E-04	5.0E-06				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

SUBCHRONIC RISK SUMMARY

FUTURE
ZONE 4 VISITOR

	CHEMICAL NAME	SUBCHRONIC HAZARD QUOTIENT SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-NON	ZONE 4-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0
		(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	2E-07	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	4E-04	5E-05				
4	Alpha-chlordan	7E-04	1E-04				
5	Alpha-endosulf	5E-05	6E-06				
6	Anthracene	0E+00	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	1E-05	NA				
9	Benzo(a)pyrene	2E-05	NA				
10	Benzo(b)fluora	2E-05	NA				
11	Benzo(g,h,i)pe	2E-05	NA				
12	Benzo(k)fluora	2E-05	NA				
13	Beta-endosulfa	5E-05	6E-06				
14	Boron	2E-04	2E-06				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	4E-02	5E-03				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	3E-05	NA				
20	Cyanide (free)	2E-05	9E-06				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	3E-03	4E-04				
24	Dibenz(a,h)ant	0E+00	NA				
25	Dieldrin	1E-03	1E-04				
26	Dimethylbenzen	0E+00	0E+00				
27	Endrin	2E-03	2E-04				
28	Fluoranthene	2E-06	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	8E-04	1E-04				
31	Gamma-hexachlo	0E+00	0E+00				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	1E-02	1E-03				
34	Indeno(1,2,3-c	1E-05	NA				
35	Lead	NA	NA				
36	Mercury, inorg	1E-03	8E-04				
37	Naphthalene	0E+00	NA				
38	Nickel	2E-03	NA				
39	Nitrate	0E+00	0E+00				
40	Nitrite	8E-05	1E-06				
41	PCB 1260	1E-02	1E-02				
42	Phenanthrene	2E-05	NA				
43	Pyrene	5E-06	NA				
44	Silver	2E-05	4E-05				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00		0E+00	0E+00			
49 Trichloroethen	0.0E+00	0.0E+00		0E+00	0E+00			
50 Uranium (solub	0.0E+00	0.0E+00		NA	NA			
51 Xylenes (total	0.0E+00	0.0E+00		0E+00	0E+00			
			PATHWAY SUM (HI)	7E-02	2E-02	0E+00	0E+00	0E+00	0E+00
			POPULATION TOTAL	9E-02					

RANGE NAME: CSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP4
LAST UPDATED: 08/18/93

CHRONIC EXPOSURE SUMMARY

FUTURE
ZONE 4 VISITOR

		CHRONIC DAILY INTAKE (mg/kg/day)					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-NON	ZONE 4-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	6.1E-08	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	6.5E-09	1.3E-09				
4	Alpha-chlordan	2.5E-08	4.9E-09				
5	Alpha-endosulf	5.8E-09	1.2E-09				
6	Anthracene	0.0E+00	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	3.0E-07	NA				
9	Benzo(a)pyrene	4.9E-07	NA				
10	Benzo(b)fluora	4.9E-07	NA				
11	Benzo(g,h,i)pe	3.7E-07	NA				
12	Benzo(k)fluora	4.4E-07	NA				
13	Beta-endosulfa	5.3E-09	1.1E-09				
14	Boron	9.0E-06	1.8E-07				
15	Cadmium (food	6.8E-07	1.4E-07				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	1.3E-06	2.5E-07				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	5.9E-07	NA				
20	Cyanide (free)	2.7E-07	1.6E-07				
21	DDD, 4,4'-	1.6E-07	3.2E-08				
22	DDE, 4,4'-	3.1E-07	6.1E-08				
23	DDT, 4,4'-	8.0E-07	1.6E-07				
24	Dibenz(a,h)ant	0.0E+00	NA				
25	Dieldrin	2.9E-08	5.9E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	3.2E-07	6.5E-08				
28	Fluoranthene	5.4E-07	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	2.7E-08	5.4E-09				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	7.5E-08	1.5E-08				
34	Indeno(1,2,3-c	2.7E-07	NA				
35	Lead	2.1E-04	2.6E-05				
36	Mercury, inorg	2.1E-07	4.1E-09				
37	Naphthalene	0.0E+00	NA				
38	Nickel	1.8E-05	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	4.8E-06	9.6E-08				
41	PCB 1260	5.2E-07	6.2E-07				
42	Phenanthrene	5.1E-07	NA				
43	Pyrene	8.3E-07	NA				
44	Silver	4.7E-08	9.4E-09				
45	Sulfide	2.2E-04	4.5E-06				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

CHRONIC RISK SUMMARY

FUTURE
ZONE 4 VISITOR

		CHRONIC HAZARD QUOTIENT					
		SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	SCENARIO 6
		ZONE 4-NON	ZONE 4-NON	0	0	0	0
		SOIL (0-2')	SOIL (0-2')	0	0	0	0
		ORAL	DERMAL	0	0	0	0
	CHEMICAL NAME	(FROM WS1)	(FROM WS2)	(FROM WS3)	(FROM WS4)	(FROM WS5)	(FROM WS6)
1	Acenaphthene	1E-06	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	0E+00	NA				
3	Aldrin	2E-04	4E-05				
4	Alpha-chlordan	4E-04	1E-04				
5	Alpha-endosulf	1E-04	2E-05				
6	Anthracene	0E+00	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	8E-06	NA				
9	Benzo(a)pyrene	1E-05	NA				
10	Benzo(b)fluora	1E-05	NA				
11	Benzo(g,h,i)pe	9E-06	NA				
12	Benzo(k)fluora	1E-05	NA				
13	Beta-endosulfa	1E-04	2E-05				
14	Boron	1E-04	2E-06				
15	Cadmium (food	7E-04	5E-03				
16	Cadmium (wate	0E+00	NA				
17	Chlordane	2E-02	4E-03				
18	Chromium (VI)	0E+00	NA				
19	Chrysene	1E-05	NA				
20	Cyanide (free)	1E-05	8E-06				
21	DDD, 4,4'-	NA	NA				
22	DDE, 4,4'-	NA	NA				
23	DDT, 4,4'-	2E-03	3E-04				
24	Dibenz(a,h)ant	0E+00	NA				
25	Dieldrin	6E-04	1E-04				
26	Dimethylbenzen	0E+00	0E+00				
27	Endrin	1E-03	2E-04				
28	Fluoranthene	1E-05	NA				
29	Fluorene	0E+00	NA				
30	Gamma-chlordan	4E-04	1E-04				
31	Gamma-hexachlo	0E+00	0E+00				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	6E-03	1E-03				
34	Indeno(1,2,3-c	7E-06	NA				
35	Lead	NA	NA				
36	Mercury, inorg	7E-04	7E-04				
37	Naphthalene	0E+00	NA				
38	Nickel	9E-04	NA				
39	Nitrate	0E+00	0E+00				
40	Nitrite	5E-05	1E-06				
41	PCB 1260	7E-03	9E-03				
42	Phenanthrene	1E-05	NA				
43	Pyrene	3E-05	NA				
44	Silver	9E-06	4E-05				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00		0E+00	0E+00				
49 Trichloroethen	0.0E+00	0.0E+00		0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00		0E+00	0E+00				
51 Xylenes (total	0.0E+00	0.0E+00		0E+00	0E+00				
			PATHWAY SUM (HI)	4E-02	2E-02	0E+00	0E+00	0E+00	0E+00
			POPULATION TOTAL	6E-02					

RANGE NAME: LSUM

SITE NAME: MTL
OPERABLE UNIT: PK/Z4 VISIT
FILE NAME: POP4
LAST UPDATED: 08/18/93

LIFETIME EXPOSURE SUMMARY

FUTURE
ZONE 4 VISITOR

	CHEMICAL NAME	LIFETIME AVERAGE DAILY INTAKE (mg/kg/day) SCENARIO 1 ZONE 4-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 4-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	9.4E-09	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00
2	Acenaphthylene	0.0E+00	NA				
3	Aldrin	9.9E-10	3.4E-10				
4	Alpha-chlordan	3.8E-09	1.3E-09				
5	Alpha-endosulf	8.9E-10	3.1E-10				
6	Anthracene	0.0E+00	NA				
7	Benzene	0.0E+00	0.0E+00				
8	Benzo(a)anthra	4.6E-08	NA				
9	Benzo(a)pyrene	7.6E-08	NA				
10	Benzo(b)fluora	7.5E-08	NA				
11	Benzo(g,h,i)pe	5.7E-08	NA				
12	Benzo(k)fluora	6.7E-08	NA				
13	Beta-endosulfa	8.1E-10	2.8E-10				
14	Boron	1.4E-06	4.8E-08				
15	Cadmium (food	1.0E-07	3.6E-08				
16	Cadmium (wate	0.0E+00	NA				
17	Chlordane	1.9E-07	6.7E-08				
18	Chromium (VI)	0.0E+00	NA				
19	Chrysene	9.0E-08	NA				
20	Cyanide (free)	4.1E-08	4.3E-08				
21	DDD, 4,4'-	2.4E-08	8.5E-09				
22	DDE, 4,4'-	4.7E-08	1.6E-08				
23	DDT, 4,4'-	1.2E-07	4.2E-08				
24	Dibenz(a,h)ant	0.0E+00	NA				
25	Dieldrin	4.5E-09	1.6E-09				
26	Dimethylbenzen	0.0E+00	0.0E+00				
27	Endrin	4.9E-08	1.7E-08				
28	Fluoranthene	8.3E-08	NA				
29	Fluorene	0.0E+00	NA				
30	Gamma-chlordan	4.1E-09	1.4E-09				
31	Gamma-hexachlo	0.0E+00	0.0E+00				
32	Heptachlor	0.0E+00	0.0E+00				
33	Heptachlor epo	1.1E-08	4.0E-09				
34	Indeno(1,2,3-c	4.2E-08	NA				
35	Lead	3.3E-05	6.8E-06				
36	Mercury, inorg	3.2E-08	1.1E-09				
37	Naphthalene	0.0E+00	NA				
38	Nickel	2.7E-06	NA				
39	Nitrate	0.0E+00	0.0E+00				
40	Nitrite	7.4E-07	2.5E-08				
41	PCB 1260	8.0E-08	1.7E-07				
42	Phenanthrene	7.8E-08	NA				
43	Pyrene	1.3E-07	NA				
44	Silver	7.2E-09	2.5E-09				
45	Sulfide	3.4E-05	1.2E-06				
46	Tetrachloroeth	0.0E+00	0.0E+00				
47	Tetrazene	0.0E+00	0.0E+00				

LIFETIME RISK SUMMARY

FUTURE
ZONE 4 VISITOR

	CHEMICAL NAME	LIFETIME EXCESS CANCER RISK SCENARIO 1 ZONE 4-NON SOIL (0-2') ORAL (FROM WS1)	SCENARIO 2 ZONE 4-NON SOIL (0-2') DERMAL (FROM WS2)	SCENARIO 3 0 0 0 (FROM WS3)	SCENARIO 4 0 0 0 (FROM WS4)	SCENARIO 5 0 0 0 (FROM WS5)	SCENARIO 6 0 0 0 (FROM WS6)
1	Acenaphthene	NA	NA	0E+00	0E+00	0E+00	0E+00
2	Acenaphthylene	NA	NA				
3	Aldrin	2E-08	6E-09				
4	Alpha-chlordan	5E-09	2E-09				
5	Alpha-endosulf	NA	NA				
6	Anthracene	NA	NA				
7	Benzene	0E+00	0E+00				
8	Benzo(a)anthra	3E-07	NA				
9	Benzo(a)pyrene	6E-07	NA				
10	Benzo(b)fluora	6E-07	NA				
11	Benzo(g,h,i)pe	NA	NA				
12	Benzo(k)fluora	5E-07	NA				
13	Beta-endosulfa	NA	NA				
14	Boron	NA	NA				
15	Cadmium (food	NA	NA				
16	Cadmium (wate	NA	NA				
17	Chlordane	3E-07	9E-08				
18	Chromium (VI)	NA	NA				
19	Chrysene	7E-07	NA				
20	Cyanide (free)	NA	NA				
21	DDD, 4,4'-	6E-09	2E-09				
22	DDE, 4,4'-	2E-08	6E-09				
23	DDT, 4,4'-	4E-08	1E-08				
24	Dibenz(a,h)ant	0E+00	NA				
25	Dieldrin	7E-08	2E-08				
26	Dimethylbenzen	NA	NA				
27	Endrin	NA	NA				
28	Fluoranthene	NA	NA				
29	Fluorene	NA	NA				
30	Gamma-chlordan	5E-09	2E-09				
31	Gamma-hexachlo	0E+00	0E+00				
32	Heptachlor	0E+00	0E+00				
33	Heptachlor epo	1E-07	4E-08				
34	Indeno(1,2,3-c	3E-07	NA				
35	Lead	NA	NA				
36	Mercury, inorg	NA	NA				
37	Naphthalene	NA	NA				
38	Nickel	NA	NA				
39	Nitrate	NA	NA				
40	Nitrite	NA	NA				
41	PCB 1260	6E-07	1E-06				
42	Phenanthrene	NA	NA				
43	Pyrene	NA	NA				
44	Silver	NA	NA				
45	Sulfide	NA	NA				
46	Tetrachloroeth	0E+00	0E+00				
47	Tetrazene	NA	NA				

48 Toluene	0.0E+00	0.0E+00	NA	NA				
49 Trichloroethen	0.0E+00	0.0E+00	0E+00	0E+00				
50 Uranium (solub	0.0E+00	0.0E+00	NA	NA				
51 Xylenes (total	0.0E+00	0.0E+00	NA	NA				
TOTAL PATHWAY CANCER RISK			4E-06	1E-06	0E+00	0E+00	0E+00	0E+00
POPULATION TOTAL EXCESS RISK			5E-06					

APPENDIX Q

DETAILED EXPOSURE AND RISK CALCULATIONS - RADIOLOGICAL

FUTURE PARK VISITOR
PARK SOIL ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	8.4E-01	4.9E+01	1.6E-11	6.6E-10
Uranium 235	1.8E-02	4.9E+01	1.6E-11	1.4E-11
Uranium 238	7.2E-01	4.9E+01	1.6E-11	5.6E-10

FUTURE PARK VISITOR
PARK SOIL EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Uranium 234	8.4E-01	3.0E+01	3.0E-11	7.5E-10
Uranium 235	1.8E-02	3.0E+01	2.4E-07	1.3E-07
Uranium 238	7.2E-01	3.0E+01	2.1E-11	4.5E-10

FUTURE PARK SWIMMER
SURFACE WATER ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	3.8E-01	5.3E+00	1.6E-11	3.2E-11
Uranium 235	0.0E+00	5.3E+00	1.6E-11	0.0E+00
Uranium 238	1.5E-01	5.3E+00	1.6E-11	1.3E-11

FUTURE PARK SWIMMER
SEDIMENT ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	1.2E+00	1.1E+01	1.6E-11	2.1E-10
Uranium 235	1.3E-01	1.1E+01	1.6E-11	2.2E-11
Uranium 238	9.1E-01	1.1E+01	1.6E-11	1.6E-10

FUTURE PARK ANGLER
FISH ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	5.6E-01	6.0E+01	1.6E-11	5.3E-10
Uranium 235	0.0E+00	6.0E+01	1.6E-11	0.0E+00
Uranium 238	2.7E-01	6.0E+01	1.6E-11	2.6E-10

FUTURE RESIDENT 1 - ZONE 1 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	6.3E-01	2.9E+02	1.6E-11	2.9E-09
Uranium 235	0.0E+00	2.9E+02	1.6E-11	0.0E+00
Uranium 238	7.3E-01	2.9E+02	1.6E-11	3.4E-09

FUTURE RESIDENT 1 - ZONE 1 (NON-EXCAVATED)
SOIL (0-2') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Uranium 234	6.3E-01	3.0E+01	3.0E-11	5.6E-10
Uranium 235	0.0E+00	3.0E+01	2.4E-07	0.0E+00
Uranium 238	7.3E-01	3.0E+01	2.1E-11	4.6E-10

FUTURE RESIDENT 1 - ZONE 1 (NON-EXCAVATED)
VEGETABLES (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	2.3E-04	1.6E+05	1.6E-11	5.8E-10
Uranium 235	0.0E+00	1.6E+05	1.6E-11	0.0E+00
Uranium 238	2.6E-04	1.6E+05	1.6E-11	6.7E-10

FUTURE RESIDENT 2 - ZONE 2 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	2.3E-01	2.9E+02	2.8E-11	1.9E-09
Thorium 232	1.2E+00	2.9E+02	1.2E-11	4.1E-09
Uranium 234	8.8E-01	2.9E+02	1.6E-11	4.1E-09
Uranium 235	4.5E-02	2.9E+02	1.6E-11	2.1E-10
Uranium 238	9.0E-01	2.9E+02	1.6E-11	4.2E-09

FUTURE RESIDENT 2 - ZONE 2 (NON-EXCAVATED)
SOIL (0-2') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Cesium 137	2.3E-01	3.0E+01	0.0E+00	0.0E+00
Thorium 232	1.2E+00	3.0E+01	2.6E-11	9.2E-10
Uranium 234	8.8E-01	3.0E+01	3.0E-11	7.9E-10
Uranium 235	4.5E-02	3.0E+01	2.4E-07	3.2E-07
Uranium 238	9.0E-01	3.0E+01	2.1E-11	5.7E-10

FUTURE RESIDENT 3 - ZONE 3 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	7.3E-01	2.9E+02	1.6E-11	3.4E-09
Uranium 235	2.0E-02	2.9E+02	1.6E-11	9.3E-11
Uranium 238	7.1E-01	2.9E+02	1.6E-11	3.3E-09

FUTURE RESIDENT 3 - ZONE 3 (NON-EXCAVATED)
SOIL (0-2') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Uranium 234	7.3E-01	3.0E+01	3.0E-11	6.5E-10
Uranium 235	2.0E-02	3.0E+01	2.4E-07	1.4E-07
Uranium 238	7.1E-01	3.0E+01	2.1E-11	4.5E-10

FUTURE RESIDENT 4 - ZONE 1 (EXCAVATED)
SOIL (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	6.4E-01	2.9E+02	1.6E-11	3.0E-09
Uranium 235	6.7E-02	2.9E+02	1.6E-11	3.1E-10
Uranium 238	6.8E-01	2.9E+02	1.6E-11	3.1E-09

FUTURE RESIDENT 4 - ZONE 1 (EXCAVATED)
SOIL (0-12') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Uranium 234	6.4E-01	3.0E+01	3.0E-11	5.8E-10
Uranium 235	6.7E-02	3.0E+01	2.4E-07	4.8E-07
Uranium 238	6.8E-01	3.0E+01	2.1E-11	4.3E-10

FUTURE RESIDENT 4 - ZONE 1 (EXCAVATED)
VEGETABLES (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	2.3E-04	1.6E+05	1.6E-11	5.9E-10
Uranium 235	2.4E-05	1.6E+05	1.6E-11	6.1E-11
Uranium 238	2.4E-04	1.6E+05	1.6E-11	6.2E-10

FUTURE RESIDENT 5 - ZONE 4 (EXCAVATED)
SOIL (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	2.9E+02	2.8E-11	9.7E-09
Thorium 232	1.0E+00	2.9E+02	1.2E-11	3.5E-09
Uranium 234	6.4E-01	2.9E+02	1.6E-11	3.0E-09
Uranium 235	2.2E-02	2.9E+02	1.6E-11	1.0E-10
Uranium 238	7.0E-01	2.9E+02	1.6E-11	3.2E-09

FUTURE RESIDENT 5 - ZONE 4 (EXCAVATED)
SOIL (0-12') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	3.0E+01	0.0E+00	0.0E+00
Thorium 232	1.0E+00	3.0E+01	2.6E-11	7.8E-10
Uranium 234	6.4E-01	3.0E+01	3.0E-11	5.8E-10
Uranium 235	2.2E-02	3.0E+01	2.4E-07	1.6E-07
Uranium 238	7.0E-01	3.0E+01	2.1E-11	4.4E-10

FUTURE RESIDENT 5 - ZONE 4 (EXCAVATED)
VEGETABLES (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	3.4E-03	1.6E+05	2.8E-11	1.5E-08
Thorium 232	1.3E-05	1.6E+05	1.2E-11	2.5E-11
Uranium 234	2.3E-04	1.6E+05	1.6E-11	5.9E-10
Uranium 235	8.0E-06	1.6E+05	1.6E-11	2.1E-11
Uranium 238	2.5E-04	1.6E+05	1.6E-11	6.5E-10

FUTURE VISITOR - ZONE 4 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	9.8E+01	2.8E-11	3.3E-09
Thorium 232	1.0E+00	9.8E+01	1.2E-11	1.2E-09
Uranium 234	7.2E-01	9.8E+01	1.6E-11	1.1E-09
Uranium 235	1.7E-02	9.8E+01	1.6E-11	2.6E-11
Uranium 238	7.8E-01	9.8E+01	1.6E-11	1.2E-09

FUTURE VISITOR - ZONE 4 (NON-EXCAVATED)
SOIL (0-2') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	3.0E+01	0.0E+00	0.0E+00
Thorium 232	1.0E+00	3.0E+01	2.6E-11	7.8E-10
Uranium 234	7.2E-01	3.0E+01	3.0E-11	6.5E-10
Uranium 235	1.7E-02	3.0E+01	2.4E-07	1.2E-07
Uranium 238	7.8E-01	3.0E+01	2.1E-11	4.9E-10

FUTURE CONST. WORKER 1 - ZONE 1 (EXCAVATED)
SOIL (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	6.4E-01	8.6E+00	1.6E-11	8.8E-11
Uranium 235	6.7E-02	8.6E+00	1.6E-11	9.2E-12
Uranium 238	6.8E-01	8.6E+00	1.6E-11	9.3E-11

FUTURE CONST. WORKER 1 - ZONE 1 (EXCAVATED)
DUST (0-12') INHALATION EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	3.2E-06	3.6E+05	2.6E-08	3.0E-08
Uranium 235	3.3E-07	3.6E+05	2.5E-08	3.0E-09
Uranium 238	3.4E-06	3.6E+05	2.4E-08	2.9E-08

FUTURE CONST. WORKER 1 - ZONE 1 (EXCAVATED)
SOIL (0-12') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Uranium 234	6.4E-01	1.0E+00	3.0E-11	1.9E-11
Uranium 235	6.7E-02	1.0E+00	2.4E-07	1.6E-08
Uranium 238	6.8E-01	1.0E+00	2.1E-11	1.4E-11

FUTURE CONST. WORKER 2 - ZONE 4 (EXCAVATED)
SOIL (0-12') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	8.6E+00	2.8E-11	2.9E-10
Thorium 232	1.0E+00	8.6E+00	1.2E-11	1.0E-10
Uranium 234	6.4E-01	8.6E+00	1.6E-11	8.9E-11
Uranium 235	2.2E-02	8.6E+00	1.6E-11	3.1E-12
Uranium 238	7.0E-01	8.6E+00	1.6E-11	9.6E-11

FUTURE CONST. WORKER 2 - ZONE 4 (EXCAVATED)
DUST (0-12') INHALATION EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	6.0E-06	3.6E+05	1.9E-11	4.1E-11
Thorium 232	5.0E-06	3.6E+05	2.8E-08	5.0E-08
Uranium 234	3.2E-06	3.6E+05	2.6E-08	3.0E-08
Uranium 235	1.1E-07	3.6E+05	2.5E-08	1.0E-09
Uranium 238	3.5E-06	3.6E+05	2.4E-08	3.0E-08

FUTURE CONST. WORKER 2 - ZONE 4 (EXCAVATED)
SOIL (0-12') EXTERNAL EXPOSURE

CHEMICAL	EPC	DURATION	SLOPE FACTOR	RISK
Cesium 137	1.2E+00	1.0E+00	0.0E+00	5.7E-01
Thorium 232	1.0E+00	1.0E+00	2.6E-11	1.4E+00
Uranium 234	6.4E-01	1.0E+00	3.0E-11	1.9E-11
Uranium 235	2.2E-02	1.0E+00	2.4E-07	5.3E-09
Uranium 238	7.0E-01	1.0E+00	2.1E-11	1.5E-11

FUTURE COMM. WORKER 1 - ZONE 1 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	6.3E-01	3.1E+02	1.6E-11	3.1E-09
Uranium 235	0.0E+00	3.1E+02	1.6E-11	0.0E+00
Uranium 238	7.3E-01	3.1E+02	1.6E-11	3.6E-09

FUTURE COMM. WORKER 2 - ZONE 2 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Cesium 137	2.3E-01	3.1E+02	2.8E-11	2.0E-09
Thorium 232	1.2E+00	3.1E+02	1.2E-11	4.4E-09
Uranium 234	8.8E-01	3.1E+02	1.6E-11	4.4E-09
Uranium 235	4.5E-02	3.1E+02	1.6E-11	2.2E-10
Uranium 238	9.0E-01	3.1E+02	1.6E-11	4.5E-09

FUTURE COMM. WORKER 3 - ZONE 3 (NON-EXCAVATED)
SOIL (0-2') ORAL EXPOSURE

CHEMICAL	EPC	HIF	SLOPE FACTOR	RISK
Uranium 234	7.3E-01	3.1E+02	1.6E-11	3.6E-09
Uranium 235	2.0E-02	3.1E+02	1.6E-11	9.9E-11
Uranium 238	7.1E-01	3.1E+02	1.6E-11	3.5E-09

APPENDIX R

EXPANDED TOXICITY SUMMARIES

1.0 ALDRIN/DIELDRIN

Aldrin and dieldrin are structurally similar organochlorine pesticides. Dieldrin differs from aldrin due to the presence of an epoxide ring. Aldrin is rapidly metabolized to dieldrin within the body. Therefore, it is not surprising that the toxicities of these two pesticides are very similar.

1.1 Noncarcinogenic Effects

Inhalation of dieldrin has produced neurological effects in humans. Symptoms including headache, muscle twitching, EEG abnormalities, and convulsions have been reported. These signs are usually reversible within weeks after exposure ceases. However, recurrent convulsions in humans have been reported up to 154 days after an inhalation exposure. Abnormal EEGs (primarily bilateral synchronous theta-wave activity), indicative of brain stem injury, can occur without clinical symptoms. No effects on serum liver enzymes have been reported in dieldrin-exposed workers (ATSDR, 1991). Data concerning the inhalation toxicity of aldrin or dieldrin in animals were not located. The EPA has not derived an inhalation RfC or RfD for aldrin or dieldrin (EPA, 1992).

Oral doses as low as 71 mg/kg of dieldrin can be fatal to humans. Ingestion of aldrin/dieldrin contaminated grain has produced neurological effects in humans including, convulsions, EEG changes, memory loss, visual light flashes, tinnitus, muscle twitches, vertigo, and fainting. Convulsions have been reported to occur up to one year after exposure, due to redistribution from the adipose tissue. Mild hepatic and immune system effects have also been noted in humans after oral exposure to aldrin/dieldrin. Exposure levels responsible for these effects have not been well quantified in humans (ATSDR, 1991).

In animals, an increased mortality has been observed in mice and rats at acute and subchronic oral doses typically ranging from 1.3 to 168 mg/kg/day dieldrin. Neurotoxic effects such as hypokinesia, tremors, convulsions, altered limbic and visual potentials, altered EEGs, and neuronal necrosis have been reported in rats or monkeys at doses typically ranging from 4 to 40 mg/kg/day dieldrin. Dieldrin has also produced immunosuppressive effects in mice at levels of 0.5 to 5 ppm in the diet (ATSDR, 1991). An increased mortality was reported in rats and mice after chronic consumption of 0.5 to 2.5 mg/kg/day of dieldrin. Chronic oral doses of 3 to 8 ppm dieldrin in the diet produced tremors and excitability in male and female rats (ATSDR, 1991). Several lifetime studies have demonstrated an ability of dieldrin to produce liver lesions. Walker et al. (1969) reported liver lesions in rats after a two-year oral administration of 1 ppm (0.05 mg/kg/day) dieldrin in the diet. This effect was not noted at a dose of 0.1 ppm (0.005 mg/kg/day) dieldrin in the diet. Similar effects were noted in rats chronically exposed to 0.5 ppm (0.025 mg/kg/day) aldrin in the diet (Fitzhugh et al., 1964).

Single doses of 3 to 30 mg/kg given during gestation resulted in increased fetal mortality, decreased fetal weight, and increased anomalies (cleft palate, webbed foot, and open eyes) in both species. Reproductive effects (decreased number of pregnancies and increased pup

mortality) were detected in rats given 0.65 to 1.3 mg/kg/day aldrin/dieldrin in the diet prior to mating and through lactation (ATSDR, 1991).

The USEPA has derived an oral administered RfD of 3E-5 and 5E-5 mg/kg/day for aldrin and dieldrin, respectively (USEPA, 1993). These values are based on the NOAEL of 0.005 mg/kg/day for dieldrin and the LOAEL of 0.025 mg/kg/day for aldrin for liver lesions in rats (Fitzhugh et al., 1964; Walker et al., 1969). The NOAEL for dieldrin was divided by an uncertainty factor of 100 (10 for interspecies variability and 10 for intrahuman variability) while the LOAEL for aldrin was divided by an uncertainty factor of 1,000 (an additional 10 for use of a LOAEL) to derive the respective RfD values. Confidence in the RfD values is judged to be medium since it is supported by other studies. A lack of good reproductive data and a lack of details in the critical study preclude the assignment of a higher confidence level (USEPA, 1993).

1.2 Carcinogenic Effects

Data from a few limited epidemiological studies on workers exposed to aldrin and dieldrin do not establish a clear relationship between exposure and carcinogenicity (ATSDR, 1991), and data concerning the carcinogenicity of inhaled dieldrin in animals were not located. However, the USEPA has estimated an inhalation cancer slope factor by extrapolation from oral data. The resulting inhalation unit risk is 4.6E-3 $(\mu g/m^3)^{-1}$, corresponding to a slope factor of 1.6E+1 $(mg/kg/day)^{-1}$ for dieldrin and 4.9E-3 $(ug/m^3)^{-1}$ or 1.7E+1 (mg/kg/day) for aldrin (USEPA, 1993).

Data concerning the carcinogenicity of ingested dieldrin in humans were not located. Several long-term mouse studies have detected a carcinogenic effect of dieldrin. Hepatocellular tumors have been reported in both sexes of several species of mice at doses typically ranging from 0.1 to 20 ppm (Davis, 1965; Meierhenry et al., 1983; NCI, 1978, Tennekes et al., 1981; Thorpe and Walker, 1973; and Walker et al., 1972). The USEPA has derived an oral administered slope factor of 1.6E+1 $(mg/kg/day)^{-1}$ for dieldrin and 1.7E+1 $(mg/kg/day)^{-1}$ for aldrin (USEPA, 1993). The values represent the geometric mean of slope factors calculated from several studies regarding liver tumors in both sexes of several species of mice (Davis, 1975; Meierhenry et al., 1983; NCI, 1978; Tennekes et al., 1981; Thorpe and Walker, 1973; and Walker et al., 1972). All slope factors were within a factor of 8 of each other (USEPA, 1993).

The USEPA has classified aldrin and dieldrin as a Group B2 (probable human carcinogen) (USEPA, 1993). This classification was based on the demonstrated hepatocarcinogenicity of dieldrin in mice. The inadequacy of human data precludes the assignment of a classification of A.

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2.0 BENZENE

2.1 Noncarcinogenic Effects

2.1.1 Inhalation Exposure

A number of epidemiological studies have been conducted on the effects of long-term inhalation exposure to benzene. The effects are mainly hematological, including the destruction of bone marrow stem cells, impaired differentiation of stem cells, and the destruction of circulating cells, leading to pancytopenia and aplastic anemia (ATSDR, 1991). According to NIOSH (1974), occupational exposures to 300 to 700 ppm are consistently associated with blood dyscrasias. The lower limit necessary for the expression of hematological effects may be less than 100 ppm (USEPA, 1989). Exposed workers have also shown changes in serum immunoglobin and complement levels, allergic reactions, and central nervous system toxicity, including drowsiness, headache, and vertigo (ATSDR, 1991).

Hematological changes have also been observed in animals exposed to benzene. Subchronic exposure to levels of 300 to 400 ppm produced decreases in hematocrit, increases in mean cell volumes and mean cell hemoglobin values, leukopenia, lymphocytopenia, and transient granulocytosis (ATSDR, 1991). Decreases in pluripotential stem cell populations have occurred in mice exposed to levels as low as 21 to 100 ppm (Cronkite et al., 1985; Toft et al., 1982). Other treatment-related effects in animals include decrements in both cell-mediated and humoral immunities (ATSDR, 1991). Ward et al. (1985) reported histological alterations in the primary sex organs of mice exposed subchronically to 300 ppm benzene vapor. Adverse reproductive effects did not occur at 30 ppm. Exposure of animals to high concentrations during pregnancy is associated with skeletal aberrations, growth retardation, and hematopoietic disturbances, but no evidence of structural terata (ATSDR, 1991). An inhalation RfD assessment for benzene is pending EPA review (USEPA, 1993).

2.1.2 Oral Exposure

The chief effects of acute high-dose oral exposure of humans to benzene are on the central nervous system. Doses above 100 mg/kg/day have produced vomiting, staggering gait, delirium, central nervous system depression, collapse and death. More moderate doses have resulted in dizziness, excitation, headache, pallor, breathlessness, weakness and chest constriction (ATSDR, 1987).

For both humans and animals, the major toxic effects attributable to repeated low-dose oral exposure to benzene involve the hematopoietic and immunological systems (ATSDR, 1991). Benzene-induced bone marrow depression is related to adverse effects on undifferentiated red cell and white cell lines (ATSDR, 1991). Wolf et al. (1956) found dose-related decrease in white blood cells in female rats administered oral doses of 10 mg/kg/day or more. No adverse hematological effects occurred at 1 mg/kg/day. Decreased white blood cells, lymphoid depletion in the spleen, and extramedullary blood cell production occurred at higher subchronic oral doses in rats and mice (NTP, 1986).

In a lifetime bioassay, NTP (1986) researchers administered benzene by gavage to groups of rats and mice of both sexes. Treatment levels were 0, 50, 100 or 200 mg/kg/day for male rats, and 0, 25, 50 and 100 mg/kg/day for all other groups. Treated rats and mice showed a dose-related decrease in lymphocytes throughout the study. Treated rats and mice also showed hyperplasia of the adrenals, Zymbal glands, pulmonary alveolar epithelium, Harderian and preputial glans, and/or ovaries.

Gavage dosing of mice with 0.5 or 1.0 mg/L benzene/kg on days 6 through 15 of gestation resulted in severe maternal toxicity and increased number of resorptions, but no increased incidence of structural malformations (Nawrot and Staples, 1979). An oral RfD assessment for benzene is pending EPA review (USEPA, 1993).

2.2 Carcinogenic Effects

The results of numerous occupational studies (Akoy, 1977; Infante et al., 1977; Rinsky et al., 1981, 1987; Ott et al., 1978; Yin et al., 1987; Wong et al., 1983) indicate an exposure-response relationship between occupational benzene levels and the development of leukemia. Based on an analysis of studies with reasonably satisfactory exposure concentration data, Rinsky et al. (1987) noted a highly significant positive trend between cumulative benzene exposure (ppm-years) and the standardized mortality ration (SMR) for benzene-related leukemias. Infante et al. (1977) observed that the occupational exposure levels associated with increased SMRs from myelogenous leukemias ranged from 10 to 100 ppm. Snyder et al. (1980) reported statistically significant increases in hematopoietic neoplasms in male mice intermittently exposed to 300 ppm, but not 100 ppm, benzene. Although only 2/40 mice exposed to 300 ppm benzene developed leukemia, the investigators considered these findings significant because leukemias are rarely observed in rodents.

USEPA (1993) lists an inhalation unit risk of 8.3E-06 $(\mu g/m^3)^{-1}$, based on an earlier EPA analysis (USEPA, 1985). The unit risk is a geometric mean average of several estimates calculated from occupational data (Rinsky et al., 1981; Ott et al., 1977; Wong et al., 1983). This inhalation unit risk corresponds to a slope factor of 2.9E-02 $(mg/kg/day)^{-1}$, assuming inhalation of 20 m^3/day of air by a 70-kg person.

Data concerning the carcinogenic potential of benzene after oral exposure in humans were not located. Maltoni and Scarnato (1979) found increases in mammary gland tumors in female rats and increases in leukemias, Zymbal gland and oral cavity tumors in both sexes of rat orally exposed for 52 weeks to 50 to 250 mg/kg/day of benzene. In chronic studies in rats, NTP (1986) reported significant dose-related increases in Zymbal gland carcinomas (both sexes) and oral cavity papillomas or carcinomas (both sexes) at oral exposure levels of 50 to 200 mg/kg/day (males) or 25 to 100 mg/kg/day (females). Groups of mice chronically treated with 0, 25, 50 or 100 mg/kg/day showed dose-related increased incidences of Zymbal gland carcinomas (both sexes), malignant lymphomas (both sexes), pulmonary adenomas and/or carcinomas (both sexes), Harderian gland adenomas and/or carcinoma (both sexes), preputial gland carcinomas, ovarian tumors, and mammary carcinomas and carcinosarcomas (females).

The EPA (USEPA 1986) evaluated the available oral animal carcinogenicity data, and decided that a route-to-route extrapolation in humans would provide a better estimate of risk than a risk estimate based on interspecies extrapolation from animal studies. Therefore, based on the occupational inhalation exposure data (Ott et al., 1978; Rinsky et al., 1981; Wong et al., 1983), the oral slope factor for benzene is 2.9E-02 $(mg/kg/day)^{-1}$ (USEPA, 1993).

USEPA classifies benzene in Group A (human carcinogen), based on evidence of nonlymphocytic leukemia in occupational studies, increased incidence of neoplasia in rats and mice exposed orally and by inhalation, and supporting genotoxicity data (USEPA, 1993).

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3.0 BORON

3.1 Noncarcinogenic Effects

Limited information from a single human study indicate that exposure to 4.1 mg B/m^3 in air for 11.4 years produces irritation of the eyes and respiratory tract (ATSDR, 1992). Respiratory tract irritation was also noted in rats exposed to 470 mg B/m^3 for 6 to 24 weeks (ATSDR, 1992). The USEPA has not derived an inhalation RfD for boron (USEPA, 1993).

Oral doses of 505 mg B/kg/day or more were lethal to infants exposed accidentally (ATSDR, 1992). Animal studies indicate that reproductive and developmental effects are of concern following oral exposure to boron. Subchronic exposure to 13.6 to 175.3 mg B/kg/day produced several developmental effects such as decreased fetal body weight, skeletal defects, and resorptions in rats and mice exposed during pregnancy (ATSDR, 1992). Reproductive effects, including testicular atrophy, impaired spermatogenesis, and decreased ovulation have been observed in rats, mice, and dogs exposed to 26-288 mg B/kg/day (ATSDR, 1992). A NOAEL of 8.8 mg B/kg/day was identified for testicular atrophy and arrested spermatogenesis in dogs (Weir and Fischer, 1972). The USEPA derived a chronic oral RfD of 9E-2 mg B/kg/day based on this NOAEL value. The NOAEL was divided by an uncertainty factor of 100 to account for intra- and interspecies variability. The USEPA rates a medium level of confidence in the RfD for boron (USEPA, 1993).

3.2 Carcinogenic Effects

Data regarding the carcinogenic effects of boron in human and animals exposed by inhalation were not located. A chronic bioassay in mice exposed to boron in the diet revealed no evidence of carcinogenicity (NTP, 1987). The carcinogenicity assessment for boron by USEPA is currently listed as pending (USEPA, 1993).

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4.0 CADMIUM

4.1 Noncarcinogenic Effects

Acute inhalation exposures to 1 mg/m^3 cadmium for eight hours may cause some deaths in humans. A large number of epidemiological studies have reported renal, pulmonary and hematological effects associated with chronic occupational exposures to cadmium. Air concentrations typically ranging from 0.023 to 1 mg/m^3 have produced tubular proteinuria, kidney lesions, emphysema and anemic in chronically exposed workers (Bonnell, 1955; Kjellstrom et al., 1977; Lauwerys et al., 1974; Materne et al., 1975; Tsuchiya, 1967; ATSDR, 1991). Based on the review of several epidemiological studies, the World Health Organization (WHO, 1980) estimated a 20-year exposure NOAEL of 0.007 mg/m^3 for cadmium. In animals, lung fibrosis and emphysema have been reported in rats and rabbits after subchronic exposure to 0.025 and 6.5 mg/m^3 cadmium, respectively (ATSDR, 1991).

The USEPA is currently reviewing an inhalation RfC for cadmium and is listed as pending (USEPA, 1993). The ATSDR has derived an inhalation Minimal Risk Level (MRL) of 2E-4 mg/m^3 (ATSDR, 1989). This values is based on a NOAEL of 0.017 ppm (Jarup et al., 1988) for renal effects in humans, and was divided by an uncertainty factor of 10 to account for intrahuman variability (ATSDR, 1991).

Acute oral doses of 25 to 1,500 mg/kg cadmium have been reported to be lethal to humans (ATSDR, 1991). Doses as low as 0.04 can produce gastrointestinal distress in humans. As with inhalation exposures, the kidney is the primary target for ingested cadmium. The renal sensitivity to cadmium stems from its ability to accumulate to high concentrations at the renal cortex, impairing renal function. The chief sign is proteinuria, but severe cases can produce electrolyte imbalance and demineralization of the bone (ATSDR, 1991). Post-mortem and in vivo measurements are in agreement with a critical concentration of 200 μg cadmium/wet weight renal cortex, above which is associated with significant proteinuria (ATSDR, 1991). In Japan, Yemagata and Shigematsu (1970) estimated a LOAEL of 0.008 mg/kg/day for proteinuria and bone disorders from intake of cadmium in rice. In mice and rats, subchronic and chronic oral administration of cadmium at doses typically ranging from 0.014 to 5 mg/kg/day have resulted in a variety of effects including a suppression of the immune system, increased mortality, decreased reproduction, developmental effects, bone mineral changes, hypertension and damage to the kidney and heart (ATSDR, 1991). Liver changes were reported in rabbits following doses of 0.013 mg/kg/day for 200 days (Stowe et al., 1972).

The USEPA has calculated an oral RfD of 5E-4 and 1E-3 mg/kg/day for cadmium in water and food, respectively (USEPA, 1993). The USEPA derived NOAELs of 0.005 (water) and 0.01 (food) mg/kg/day for cadmium based on a toxicokinetic model that assumes 2.5% absorption from food, 5% absorption from water, 0.01% elimination of cadmium body burden/day and the critical value of 200 μg cadmium/gram wet weight renal cortex (USEPA, 1985a). The NOAELs were divided by an uncertainty factor of 10 to account for intrahuman variability. Confidence in these values is rated high since they are based on data from

numerous human and animal studies, and the model includes all relevant pharmacokinetic parameters (USEPA, 1993).

4.2 Carcinogenic Effects

Epidemiological studies have revealed limited evidence for an excess risk of lung cancer in cadmium-exposed workers. Thun et al. (1985) reported a two-fold excess risk of lung cancer in cadmium smelter workers exposed to 170 to 2,500 $\mu g/m^3$ for six months or more. Several other studies have also indicated increased risks for lung cancer or prostate cancer. However, these studies are limited due to a small number of cases and exposure to other chemicals. In rats, inhalation of 12.5 to 50 $\mu g/m^3$ for 18 months produced a dose-dependent increase in lung tumors (Takenaka et al., 1983). Intratracheal instillation studies have also reported increased tumor incidences in the mammary gland and prostate in rats (ATSDR, 1991; USEPA, 1985b). The USEPA (1993) has calculated an inhalation unit risk of 1.8E-3 $(\mu g/m^3)^{-1}$ corresponding to a slope factor of 6.1E+0 $(mg/kg/day)^{-1}$ based on the lung cancer data in smelter workers (Thun et al. 1985). Although the use of animal data would result in a higher (and therefore, more conservative) slope factor, USEPA concluded it was more appropriate to use the data from Thun et al. (1985) to avoid complications due to species variation and type of exposure (cadmium salt versus cadmium fume or oxide).

Mortality studies in humans and carcinogenicity studies in animals have not detected any increased cancer incidences following oral exposure to cadmium (ATSDR, 1991; USEPA, 1985b). The USEPA has not derived an oral slope factor for cadmium (USEPA, 1993).

4.3 Beneficial Effects

Animals fed low-cadmium diets were reported to have depressed growth, impaired reproduction and other effects (NAS, 1989). The Food and Nutrition Board considers the evidence for cadmium essentiality to be weak, and if it exists, it is probably met by the typical daily intake of 0.0004 mg/kg/day in the diet (ATSDR, 1991; NAS, 1989).

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5.0 CESIUM

5.1 Noncarcinogenic Effects

Data regarding the noncarcinogenic effects of cesium are very limited. Acute oral LD50 values range from 800 to 2,300 mg/kg cesium have been reported in mice and 1,026to 2,386 mg/kg in rats (Stokinger, 1981). The LD50 value was somewhat dependent on the form (chloride, iodide, or hydroxide) of cesium administered. No data were located regarding the long-term toxicity of cesium in humans or animals following inhalation or oral exposure.

5.2 Carcinogenic Effects

No data were located regarding the carcinogenic effects of cesium in humans or animals. However, cesium is a beta-emitting radionuclide (Stokinger, 1981). USEPA classifies all radionuclides as Group A (human carcinogen) (USEPA, 1992). USEPA has derived slope factors for various isotopes of cesium ranging from 3.9E-14 to 2.8E-11 (risk/pCi) for inhalation exposure, 4.1E-14 to 4.1E-11 (risk/pCi) for oral exposure, and 2.8E-9 to 8.3E-6 (risk/yr per pCi/g soil) for external exposure (USEPA, 1992).

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6.0 CHLORDANE

6.1 Noncarcinogenic Effects

Inhalation exposure of workers to chlordane has produced gastrointestinal symptoms similar to those for oral exposures, including hepatic effects (jaundice), respiratory effects (chest pains, tachycardia and dyspnea), and neurological effects (headache, dizziness, impaired vision, incoordination, irritability, weakness, and muscle twitching). Exposure concentrations producing these effects were not well documented (ATSDR, 1989). However, occupational exposure to 0.0012 to 0.0017 mg/m^3 chlordane for 1 to 15 years did not produce any adverse effects in production workers (ATSDR, 1992).

Only one animal study was located concerning the noncarcinogenic effects of inhaled chlordane. Hepatocellular enlargement or vacuolization was noted in rats exposed to 1 mg/m^3 for 8 hours/day, 5 days/week, for 13 weeks. Increased liver weights were reported in both rats and monkeys at a concentration of 10 mg/m^3. Rats also displayed minor alterations in the thyroid epithelium at this exposure level. These effects were not apparent in either species at a concentration of 0.1 mg/m^3 chlordane. No other effects were noted in this study (VCC, 1984). The EPA has not derived an inhalation administered RfC or RfD for chlordane, although a value is currently under review by a EPA workgroup (EPA, 1993).

Estimated oral doses of 25-104 mg/kg chlordane have caused death in humans. Gastrointestinal symptoms (nausea, cramps, and diarrhea) and neurological effects (headache, dizziness, irritability, confusion, incoordination, tremors, seizures, convulsions, and coma in severe cases) were reported in 18% of residents using water contaminated with 0.1-92,500 ppb chlordane. Signs of kidney and lung damage have also been reported in an acute poisoning case (ATSDR, 1992).

Decreased survival has been reported in rats, mice, and rabbits following subchronic ingestion of 20.8 to 80 mg/kg/day chlordane. Other effects including induction of hepatic enzymes, inhibition of brain ATPase, and convulsions have been reported in rats given oral doses of 1.25 to 6.25 mg/kg/day for 4 to 12 weeks (ATSDR, 1989). A decreased survival has been reported in mice and rats consuming 3.9 to 6 mg/kg/day for 80 weeks. Hepatic effects including organ weight changes and histopathological lesions have been reported in rats and mice after oral administration of 0.3 to 0.65 mg/kg/day chlordane for 18 to 30 months. Regional hypertrophy of the liver was noted in rats ingesting chlordane at 5 ppm (0.273 mg/kg/day) in the diet for 30 months, but not at a level of 1 ppm (0.055 mg/kg/day) chlordane (VCC, 1983). Tremors and a decreased body weight gain have been observed in rats and mice consuming 7.3 to 12.1 mg/kg/day for 80 weeks (ATSDR, 1991). Decreases in fertility were noted in rats after subchronic oral intakes of 16 mg/kg/day. Developmental effects, including behavioral alterations and death within the first week of the nursing period, occurred in the offspring of mice given 1 to 8 mg/kg/day throughout gestation (ATSDR, 1992).

The EPA has derived an oral administered RfD of 6E-5 mg/kg/day for chlordane (EPA, 1993). This value is based on a NOAEL of 0.055 mg/kg/day for hepatic effects in rats (VCC, 1983). The NOAEL was divided by an uncertainty factor of 1,000 (10 for interspecies variability, 10 for intrahuman variability, and 10 for the lack of information in a second species and a lack of reproductive data) to derive the RfD. Confidence in this value is judged to be low due to the inadequacy of the data base (EPA, 1992).

6.2 Carcinogenic Effects

Cancer mortality data are available from three epidemiological studies on pesticide workers exposed to chlordane. Of these, one showed a marginally significant increase in mortality from bladder tumors. These studies were limited by inadequate sample sizes, inadequate follow-up duration, and confounding exposures to other chemicals (EPA, 1993). Data concerning the carcinogenic effects of chlordane after inhalation exposure in animals were not located in the literature cited in the reference section.

The EPA has derived an inhalation administered unit risk of 3.7E-4 $(\mu g/m^3)^{-1}$ corresponding to a slope factor of 1.3E+0 $(mg/kg/day)^{-1}$ for chlordane (EPA, 1993). This value was based on the oral studies reporting increased liver tumors in mice (NCI, 1977; VCC, 1973). An adequate number of animals was used in both studies, and tumors were noted in both sexes of two species of mice.

Data concerning the carcinogenicity of ingested chlordane in humans were not located. Oral administration of chlordane has produced increases in liver tumors in mice. Doses of 0.052-0.66 mg/kg/day chlordane in the diet produced hepatocellular carcinomas in both sexes of two species of mice (NCI, 1977; VCC, 1973). Other studies have also shown an increased incidence of liver tumors in mice and rats exposed to chlordane (ATSDR, 1992).

The EPA has derived an oral administered slope factor of 1.3E+0 $(mg/kg/day)^{-1}$ for chlordane (EPA, 1993). This value was based on the increased liver tumors observed in mice (NCI, 1977; VCC, 1973). An adequate number of animals was used in both studies, and tumors were noted in both sexes of two species of mice. The EPA has classified chlordane in Group B2: probable human carcinogen (EPA, 1992). This classification was based on sufficient evidence of liver cancer in animals but inadequate evidence of carcinogenicity in humans.

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7.0 CHROMIUM

Chromium exists in the environment mainly as salts of Cr(III) and as oxy-compounds of Cr (VI). In general, the toxicity of Cr(III) is less than for Cr(VI), therefore these two forms are discussed separately below.

7.1 Noncarcinogenic Effects

Chromium (III)

A single study reported no adverse effects on the kidneys of workers exposed to 75 μg $Cr(III)/m^3$ for 2 to 12 years (ATSDR, 1991). Little data are available describing adverse effects in animals following inhalation exposures to Cr(III). Johansson et al. (1986) reported a decrease in phagocytic activity in macrophages in rabbits exposed via inhalation at

600 $\mu g/m^3$ Cr(III) [$Cr(NO_3)_3$] for four to six weeks. ATSDR (1991) considers this value to be a LOAEL for intermediate Cr(III) exposure. There is no inhalation RfD for Cr(III) at this time (USEPA, 1993).

Data concerning the toxicity of ingested Cr(III) in humans were not located. Oral exposures to Cr(III) compounds are not associated with significant toxicity except at very high doses. In rats, acute oral LD_{50} values range from 183 to 2,365 mg Cr(III)/kg (ATSDR, 1991). Decreased spermatogenesis was observed in male mice exposed to 3.5 mg Cr(III)/day for 7 weeks (ATSDR, 1991). Chronic exposure of rats to water containing 25 mg Cr(III)/L (2.4 mg/kg/day) for one year resulted in no detectable adverse effects (USEPA, 1985, 1987). No treatment related effects were reported for rats exposed to doses up to 1,468 mg Cr(III)/day in the diet for two years (Ivankovic and Preussmann, 1975). However, in the subchronic portion of this study, the dose level of 1,468 mg/kg/day for 90 days produced decreased liver and spleen weights in rats. The chronic NOAEL of 1,468 mg/kg/day was used to derive an oral RfD of 1E+0 mg/kg/day (USEPA, 1992). The NOAEL was divided by an uncertainty factor of 100 to account for interspecies and intraspecies variability, and an additional modifying factor of ten was used to account for uncertainty in the NOAEL since the same value was reported as a LOAEL in the 90-day study. Confidence is rated low due to lack of experimental protocol in the critical study and a lack of supporting data (USEPA, 1993).

Chromium (VI)

The respiratory tract is a target of intermediate and chronic inhalation exposure to chromium. Many cases of nasal mucosal ulceration and nasal septal perforation have been reported in persons occupationally exposed to Cr (VI). Lindberg and Hedenstierna (1983) reported that evidence, of adverse nasal effects was found at mean exposure levels of 2 to 200 $\mu g/m^3$ Cr (VI) but not at <1 $\mu g/m^3$ Cr (VI). That a concentration of about 2 $\mu g/m^3$ is an effect level is supported by the Kuperman (1964) study which reported nasal irritation in sensitive individuals at a concentration of 2.5 to 4 $\mu g/m^3$. Because the nasal effects observed in the Lindberg and Hedenstierna (1983) study at concentrations <0.2 $\mu g/m^3$ were mild and no effects were observed at <1 $\mu g/m^3$, a concentration of 1 $\mu g/m^3$ is considered a NOAEL for nasal effects (ATSDR, 1991). In animals, respiratory tract effects such as nasal mucosa perforation, granulomata of the lungs, bronchial epithelial necrosis and alveolar proteinosis have been reported in several species following exposures typically ranging from 1,600 to 4,300 $\mu g/m^3$ Cr(VI). Immune system depression was apparent in rats after exposure to 200 $\mu g/m^3$ Cr(VI) for 90 days (ATSDR, 1991). Using the LOAEL of 0.002 mg/m^3 as described by Lindberg and Hedenstierna (1983), ATSDR derived an intermediate duration inhalation MRL of 2E-05 mg/m^3 (ATSDR, 1991). An inhalation RfC is currently under review by USEPA (USEPA, 1993).

By the oral route, Cr (VI) is somewhat more toxic than Cr(III), with oral LD_{50} values ranging from 14 to 29 mg/kg (ATSDR, 1991). Lethal doses in humans have been estimated to range from 4.1 to 29 mg/kg (ATSDR, 1991). However, detrimental effects from long-term ingestion of low levels of Cr(VI) have not been observed (USEPA, 1987, 1985).

Chronic ingestion of water containing 1 mg/L of Cr(VI) over a three-year period did not produce any adverse health effects in a Long Island family drinking from a private well (USEPA 1985). Nausea was the only effect observed in an individual consuming a 10 ppm solution of Cr(VI) for 15 days (ATSDR, 1991). As observed for Cr(III), Cr(VI) caused a decreased in spermatogenesis at doses of 4.6 mg/kg-day for 7 weeks (ATSDR, 1991). No adverse health effects were observed in rats following the ingestion of Cr(VI) in drinking water at 14.4 mg/kg-day for 60 days (USEPA 1985). Female dogs administered potassium chromate (K_2CrO_4) in their drinking water at 11.2 mg Cr(VI)/L for four years showed no abnormalities in physical condition, food consumption or growth rate. Sprague-Dawley rats administered water containing K_2CrO_4 at concentrations up to 25 mg Cr(VI)/L (2.4 mg/kg/day) for one year exhibited no pathologic effects (MacKenzie et al., 1958). This study in rats was used to calculate a chronic oral RfD of 5.0E-03 for Cr(VI) (USEPA, 1993). The NOAEL of 2.4 mg/kg/day was divided by an uncertainty factor of 100 to account for interspecies and intraspecies variability. Confidence in this value is low due to the small number of animals used and parameters measured in the critical study; the supporting studies are also of low quality (USEPA, 1993).

7.2 Carcinogenic Effects

Chromium (III)

A single epidemiological study reported an increased incidence of lung cancer in workers exposed to 0.25 mg/m^3 insoluble Cr(III) (ATSDR, 1991). Other studies have reported increases in lung cancer incidence in workers exposed to mixtures of Cr(III) and Cr(VI), however, these cancers are mainly attributed to exposure to CrVI (ATSDR, 1991). Chromium (III) has not been evaluated by EPA for human carcinogenic potential (USEPA, 1993).

Chromium (VI)

Results of several epidemiologic studies consistently link inhalation of Cr (VI) to increased incidences of lung tumors (USEPA, 1993). Increases in lung cancer incidence have been observed in workers exposed to 0.04 to 0.5 mg Cr(VI)/m^3 (ATSDR, 1991). Some studies, however, did not attempt to determine between exposures to Cr III or Cr VI but there is sufficient evidence in other occupational studies to attribute the carcinogenic potential to Cr (VI).

Sufficient animal data also exist to conclude that Cr (VI) is carcinogenic by a number of routes (intramuscular injection site tumors, intrapleural implant site tumors, intrabronchial implantation site tumors and subcutaneous injection site sarcomas (USEPA, 1993)).

Chromium (VI) has been assigned a weight-of-evidence classification of A (a human carcinogen) by the inhalation route (USEPA, 1993). An inhalation unit risk of 1.2E-2 (μg/m^3)$^{-1}$ corresponding to a slope factor of 4.2E+01 (mg/kg-day)$^{-1}$ was calculated by USEPA from available epidemiological studies that indicate a dose-response relationship

between Cr(VI) and lung cancer. There is no convincing evidence that oral exposure to Cr(VI) is carcinogenic (USEPA, 1987).

7.3 Beneficial Effects

Chromium (III) produces beneficial effects when administered to animals fed a chromium deficient diet. Beneficial effects include enhanced glucose uptake, decreased blood cholesterol levels and increased life span. An estimated safe and adequate human intake for Cr(III) of 50 to 200 μg/day has been calculated by the National Academy of Sciences (NAS 1989). The average daily intake of chromium in the U.S. is about 60 to 100 μg/day, mostly in food.

7.4 References

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8.0 COBALT

8.1 Noncarcinogenic Effects

Respiratory effects including irritation, wheezing, asthma, pneumonia, and fibrosis have been documented in workers exposed to 0.003 to 0.893 mg/m^3 cobalt in workplace air (Shirakawa et al., 1988; Sprince et al., 1988). Chronic exposure to 0.038 mg/m^3 resulted in reduced ventilatory function due to bronchial obstruction. One case report details the death of a metal worker due to cardiomyopathy (see oral effects), accompanied by hepatic, renal, and conjunctival congestion following a four year exposure to an undetermined concentration of cobalt. High cobalt concentration were reported in this worker's tissues. Concentrations as low as 0.007 mg/m^3 have been shown to produce cobalt sensitization in some metal workers (ATSDR, 1990).

Deaths have been produced in rats and hamsters at exposure concentrations ranging from 9 to 83 mg/m^3. Subchronic exposure to 9 mg/m^3 cobalt dust has resulted in lung inflammation, increased hemoglobin, and weight loss in rats, guinea pigs, or dogs. Rabbits and pigs have developed lung inflammation or EKG changes at exposures ranging from 0.1 to 0.4 mg/m^3 cobalt (ATSDR, 1990). The concentrations producing these effects are at least one order of magnitude greater than those required to produce similar effects in humans. The USEPA has not derived an inhalation RfC or RfD for cobalt.

Fatalities have occurred in humans consuming beer containing cobalt (II) sulfate (added as an anti-foaming agent in the 1960s) for a number of years. Assuming an intake of 8 to 30 pints of beer per day, the resulting intake of cobalt was 0.04 to 0.14 mg/kg/day. Death was attributed to cardiomyopathy as characterized by sinus tachycardia, left ventricular failure, cardiogenic shock, diminished myocardial compliance, no myocardial response to exercise or catecholamine, enlarged heart, pericardial effusion, and extensive intracellular changes. It should be noted that other etiological factors including heavy alcohol consumption and nutritional status may also have contributed to these effects, since administration of 1 mg/kg/day to healthy individuals for up to 32 weeks did not result in any cardiac injury. A number of other organ systems were also affected in the cobalt-beer drinkers including the lungs (rales and edema), gastrointestinal system (nausea, vomiting and diarrhea), and liver (necrosis and enzyme level changes) (Alexander, 1969, 1972; Morin et al., 1971). Intakes of 0.16 to 1.0 mg/kg/day cobalt have been reported to cause an increased production of red blood cells in humans. Severe visual impairment (optic atrophy and impaired choroidal perfusion) were noted in a man given 1.3 mg/kg/day for several weeks. Doses of

0.54 mg/kg/day for 10 to 25 days have resulted in an interference of iodine uptake by the thyroid in humans. Sensitization to cobalt resulting in eczema has been observed after oral exposures as low as 0.014 mg/kg/day (ATSDR, 1990). No developmental effects were noted in human fetuses when pregnant women were treated with 0.6 mg/kg/day cobalt for 90 days to raise hematocrit and hemoglobin levels (ATSDR, 1990).

In general, effects similar to those observed in humans have also been observed in animals, but at doses 1 to 2 orders of magnitude higher than those required to produce effects in humans. Increased hematocrit and red blood cell count, cardiomyopathy and degeneration, hepatic and renal necrosis, and behavioral changes have been reported in rats, guinea pigs, or dogs at subchronic oral doses typically ranging from 5 to 26 mg/kg/day cobalt (ATSDR, 1990). Several studies on adult rats have indicated that oral doses of 5.7 to 30.2 mg/kg/day for 2 to 3 months can produce testicular degeneration and atrophy (ATSDR, 1990). The USEPA has not derived an oral administered RfD for cobalt.

8.2 Carcinogenic Effects

One occupational study reported a nonstatistically significant increase in the incidence of lung cancer death in workers exposed to cobalt compared to an unexposed control group. Intermittent lifetime exposure to 7.9 mg/m^3 cobalt did not produce an increased incidence of tumors in hamsters. Tumors have been induced in animals following intramuscular, subcutaneous, or intrathoracic injection of cobalt, however the significance of these studies is uncertain (ATSDR, 1990).

The U.S. has not derived an inhalation administered unit risk for cobalt.

Data concerning the carcinogenicity of ingested cobalt in humans or animals were not located. The USEPA has not evaluated cobalt for its carcinogenic potential in humans.

8.3 Beneficial Effects

By itself, cobalt is not an essential trace mineral. However, cobalt is an integral part of vitamin B_{12}. Vitamin B_{12} is essential for normal growth and development. Higher plants and animals cannot synthesize vitamin B_{12} and therefore rely on its synthesis by bacteria. A cobalt deficient diet can produce vitamin B_{12} deficiency in ruminant animals that depend entirely on their bacteria for their vitamin B_{12} intake. This may also be true for strict vegetarians. However, since the human diet is rarely deficient in vitamin B_{12} (provided primarily by the intake of animal products where vitamin B_{12} has accumulated from bacterial synthesis) the Food and Nutrition Board does not consider it necessary to establish an RDA for cobalt (FNB, 1989).

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9.0 CYANIDE

9.1 Noncarcinogenic Effects

Cyanide (CN) is a general cellular poison which acts by binding in place of oxygen to heme-containing enzymes. In particular, cyanide binds to mitochondrial cytochrome oxidase, thereby blocking the cell's ability to oxidize metabolites and generate energy. Many tissues are affected by exposure to cyanide, but the nervous system is usually the most sensitive. Symptoms of acute cyanide toxicity include a dry burning throat, suffusing warmth, rapid breathing, gasping, tremors and convulsions.

9.1.1 Inhalation Exposure

Information on the effects of inhalation exposure to cyanide is limited. Concentrations of 135 to 543 ppm in air are fatal to humans for acute exposures (ATSDR, 1991). Chronic exposure of humans to cyanide in the workplace has been associated with thyroid abnormalities (El Ghawabi et al., 1975) and increased incidence of nonspecific symptoms such as headache and nausea (Blanc et al., 1985). Eye irritation, visual impairment and delayed memory were noted in workers exposed to 0.19 ppm CN (ATSDR, 1991). The USEPA has not determined an RfC or RfD for inhalation exposure to cyanide (USEPA, 1993).

9.1.2 Oral Exposure

The fatal oral dose in humans ranges from 0.5 to 2.9 mg CN/kg (USEPA, 1987). Acute exposure to 15 to 22.7 mg CN/kg produced a number of effects in humans including vomiting, atrial fibrillation, hyperventilation, stupor and coma (ATSDR, 1991). In rats, a two-year dietary study did not detect any significant adverse health effects at doses up to 10.8 mg CN/kg-day (Howard and Hazal, 1955). Other studies have reported neurological effects such as behavior changes, hyperactivity and lethargy in rats and/or pigs exposed to 0.14 to 14.5 mg CN/kg/day (ATSDR, 1991). Rats consuming 30 mg CN/kg-day for one year had myelin and thyroid degeneration as well as weight loss (Philbrick et al., 1979). Based upon the NOAEL of 10.8 mg CN/kg-day from the Howard and Hazal study, the USEPA has calculated a chronic oral RfD for cyanide of 2E-2 mg/kg-day. The NOAEL was divided by an uncertainty factor of 100 to account for interspecies and intraspecies variation, and by a modifying factor of 5 to account for the apparent tolerance to cyanide observed when administered with food. The USEPA has medium confidence in this value (USEPA, 1993). The RfD is also considered to be suitable for evaluating subchronic oral exposure to cyanide (USEPA, 1992).

9.2 Carcinogenic Effects

No human or animal data were located regarding the carcinogenic potential of cyanide (ATSDR, 1991). The USEPA (1993) has assigned cyanide a weight-of-evidence classification of D (not classifiable) based on the fact that pertinent information regarding potential carcinogenic effects of cyanide were not located in the available literature.

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10.0 DDD

DDD is the acronym for 1,1-dichloro-2,2-bis(p-chlorophenyl)-ethane.

10.1 Noncarcinogenic Effects

Data concerning the toxicity of inhaled DDD in humans or animals were not located.

Data concerning the toxicity of ingested DDD in humans were not located in the literature cited in the reference section. In rats, Hamid et al. (1974) administered 121 mg/kg/day DDD for 16 days and noted plaque and rosette forming cells in the thymus and spleen and atrophy of the thymus, which are indicative of an immunological effect. Another study reported decreased hepatic enzymic hydroxylation activities in mice given 26 mg/kg/day DDD for 1 week, but this was not judged to be an adverse effect (ATSDR 1992). In female rats, oral administration of 28 mg/kg/day DDD on days 15 to 19 of gestation resulted in delayed vaginal opening, altered adrenal weight, and loss of the corporal lutea in the offspring (Gellert and Heinrichs, 1975). The National Cancer Institute (NCI 1978) did not report any adverse effects on the respiratory, cardiovascular, gastrointestinal, hematological, hepatic, and renal systems in mice at doses of up to 107 mg/kg/day for 2 years or rats at doses of up to 165 mg/kg/day DDD for 2 years. The USEPA has not derived a chronic oral RfD for DDD (USEPA 1993).

10.2 Carcinogenic Effects

Data concerning the carcinogenic effects of DDD after inhalation exposure in humans or animals were not located in the literature cited in the reference section.

Data concerning the carcinogenic effects of DDD after oral exposure in humans were not located in the literature cited in the reference section. Oral exposure to DDD has resulted in increased tumors in the lung tissue of male and female mice at doses of 32.5 mg/kg/day or more (Tomatis et al., 1974), the liver tissue of male and female mice at doses of 32 mg/kg/day or more (NCI, 1978; Tomatis et al., 1974), and thyroid tissue of male rats at doses of 85 mg/kg/day or more (NCI, 1978). The USEPA has derived an oral slope factor of 2.4E-1 $(mg/kg/day)^{-1}$ for DDD (USEPA, 1993). This value is based on the development

of liver tumors in male mice (Tomatis et al., 1974). This slope factor is within a factor of two of the slope factors for structurally similar chemicals DDE and DDT for the same tissue site (USEPA, 1993).

The USEPA has classified DDD in Group B2: probable human carcinogen (USEPA, 1993). This classification is based on the carcinogenic effects of DDD in the lung, liver, and thyroid tissue in mice and/or rats. In addition, structurally similar chemicals such as DDT and DDE are also considered to be probable human carcinogens.

10.3 REFERENCES

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11.0 DDE

DDE is the acronym for 1,1-dichloro-2,2-bis(p-chlorophenyl)-ethylene.

11.1 Noncarcinogenic Effects

Data concerning the toxicity of inhaled DDE in humans or animals were not located.

Data concerning the toxicity of ingested DDE in humans were not located. Hepatic effects including increased liver weight, increased total protein, and increased enzyme levels were reported in mice following a 1 week exposure to 26 mg/kg/day DDE in the diet (Pasha, 1981). In hamsters and rats, chronic exposure to 12 to 80 mg/kg/day DDE resulted in liver necrosis (Cabral et al., 1982; NCI, 1978; Rossi et al., 1983). This effect was not observed in mice at a dose of 34 mg/kg/day DDE in the diet for 78 weeks (NCI, 1978). One study in

rats noted an increased neonatal body weight after exposure to 28 mg/kg/day DDE on days 15 to 19 of gestation (Gellert and Heinrichs, 1975). The USEPA has not derived a chronic oral RfD for DDE (USEPA, 1993).

11.2 Carcinogenic Effects

Data concerning the carcinogenicity of inhaled or ingested DDE in humans were not located. Oral exposure to DDE has resulted in increased tumors in the liver tissue of male and female mice at doses as low as 19 mg/kg/day and in hamsters at doses of as low as 41.5 mg/kg/day DDE in the diet (NCI, 1978; Rossi et al., 1983; Tomatis et al., 1974). A statistically significant trend for thyroid tumors has also been noted in female rats given diets containing 242 to 462 ppm DDE in the diet (NCI, 1978).

The USEPA has derived an oral slope factor of 3.4E-1 $(mg/kg/day)^{-1}$ for DDE (USEPA, 1993). This value is based on the development of liver tumors in mice and hamsters (NCI, 1978; Rossi et al., 1983; Tomatis, 1974). This slope factor is within a factor of two of the slope factors for structurally similar chemicals DDD and DDT for the same tissue site (USEPA, 1993). The USEPA has classified DDE in Group B2, probable human carcinogen (USEPA, 1993). This classification is based on the carcinogenic effects of DDE in the liver and thyroid tissue in mice, hamsters, and rats. In addition, structurally similar chemicals such as DDT and DDD are also considered to be probable human carcinogens.

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12.0 DDT

DDT is the acronym for 1,1,1-trichlor-2,2-bis(p-chlorophenyl)ethene.

12.1 Noncarcinogenic Effects

Data concerning the toxicity of inhaled DDT in humans or animals were not located.

The nervous system is the primary target system for ingested DDT in humans. Ingestion of 6 mg/kg has produced perspiration, headache and nausea, while doses of 10 mg/kg DDT have resulted in vomiting in humans. Convulsions have been reported in individuals consuming 16 mg/kg DDT (Hsieh, 1954). Velbinger (1947a, 1947b) noted altered facial sensitivity after oral doses of 3.6 to 7.1 mg/kg; malaise, impaired gait, cold moist skin and contact hypersensitivity at doses of 10.7 to 14.3 mg/kg, and a prickling sensation in the face, impaired equilibrium, confusion, tremors, malaise, headache, fatigue and vomiting in subjects ingesting 21.4 mg/kg DDT. Serum antibody levels were higher in humans ingesting 0.07 mg/kg/day DDT for 20 days compared to controls, when challenged with Salmonella typhimurium, however the toxicological significance of this observation is uncertain (Shiplov et al., 1972). Accidental intakes of 4.1 to 24.5 mg/kg have produced tachycardia in humans. Doses of up to 285 mg/kg have not resulted in any fatalities in adults, although one child died following consumption of 1 ounce of a 5% DDT solution in kerosene (ATSDR, 1992). Hayes et al., (1959) did not find any adverse effects on the hepatic, hematological, and cardiovascular systems of humans after a 12 to 18 month exposure to 0.61 mg/kg/day DDT.

A great deal of information is available on the effects of orally ingested DDT in animals. Liver lesions and necrosis have been reported in rats following the oral administration of 0.25 to 3.75 mg/kg/day DDT for 27 to 36 weeks (ATSDR, 1992; Laug et al., 1950). These effects were not noted at doses of 0.05 mg/kg/day DDT (Laug et al., 1950). Hepatic effects including amyloidosis, hypertrophy, and necrosis have also been reported in mice, hamsters, monkeys and/or dogs at chronic oral doses ranging from 2.9 to 80 mg/kg/day DDT. Hemolysis, congestion of the spleen, and tremors were noted in rats after chronic exposures to 10 to 11 mg/kg/day DDT. Doses of 0.18 to 121 mg/kg/day DDT have resulted in immunological effects such as atrophy of the thymus, decreased antibody titer, and decreased mast cells in rabbits, mice and rats. A decreased brain lipid content was reported in monkeys following oral exposure to 10 mg/kg/day DDT for 100 days (ATSDR, 1992). Increased offspring mortality, decreased fertility, decreased litters, decreased uterine weight, and increased estrus cycle have been reported in rats and mice at doses ranging from 0.35 to 32.5 mg/kg/day DDT administered for subchronic to chronic durations (ATSDR, 1992).

Doses of 0.5 to 26 mg/kg/day DDT have resulted in decreased ovary weight, increased resorptions, decreased fetal weight, decreased growth, decreased learning, premature puberty, decreased survival and tail abnormalities in rats, mice, rabbits and/or dogs (ATSDR, 1992). Other animal studies have reported no adverse effects at doses of up to 165 mg/kg/day DDT (ATSDR, 1992). The USEPA has derived a chronic oral RfD of 5.0E-04 mg/kg-day (USEPA, 1993). This RfD is based on the NOAEL OF 0.5 mg/kg-day in rats (Laug et al., 1950) using an uncertainty factor of 100 to account for inter- and intraspecies variability. The USEPA places medium confidence in this RfD (USEPA, 1993).

12.2 Carcinogenic Effects

Data from existing epidemiological studies on DDT exposed workers do not indicate an association between DDT exposure and cancer development. However, limitation such as inadequate exposure and observation durations, inadequate quantification of exposure, and exposure to other chemicals do not allow for any conclusions to be made from these studies (USEPA, 1993). Recently, exposure to DDT has been linked to an increased risk of breast cancer in women (Wolff et al., 1993). Data concerning the carcinogenic effects of DDT after inhalation exposure in animals were not located in the literature cited in the reference section. The USEPA has derived a chronic inhalation unit risk of 9.7E-6 $(\mu g/m^3)^{-1}$ for DDT (USEPA, 1993). This value is based on the oral studies which demonstrate a carcinogenic effect in the liver of rats and mice (Cabral et al., 1982; Rossi et al., 1977; Terracini et al., 1973; Tomatis and Turusov, 1975; Thorpe and Walker, 1973; Turusov et al., 1973).

Data concerning the carcinogenicity of ingested DDT in humans were not located. Nine studies in mice and rats have demonstrated a carcinogenic effect in the liver for DDT at doses as low as 0.26 mg/kg/day (Cabral et al., 1982; Innes et al., 1969; Kashyap et al., 1977; Rossi et al., 1977; Terracini et al., 1973; Thorpe and Walker, 1973; Tomatis and Turusov, 1975; Turusov et al., 1973; Walker et al., 1973). Two of these studies also demonstrated tumor development in the lungs of mice. Hamsters, who can not metabolize DDT to DDE or DDD, did not develop tumors when chronically exposed to DDT. Exposure of dogs and monkeys also did not result in tumor development (USEPA, 1993). The USEPA has derived an oral slope factor of 3.4E-1 $(mg/kg/day)^{-1}$ for DDT (USEPA, 1993). This value represents a geometric mean of six slope factors based on the development of liver tumors in mice and rats (Cabral et al., 1982; Rossi et al., 1977; Terracini et al., 1973; Tomatis and Turusov, 1975; Thorpe and Walker, 1973; Turusov et al., 1973).

The USEPA has classified DDT in Group B2 (probable human carcinogen) (USEPA, 1993). This classification is based on the carcinogenic effects of DDT in the liver and lung tissue in mice and/or rats.

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13.0 DIBENZOFURAN

No data were located regarding the noncarcinogenic or carcinogenic effects of dibenzofuran in humans or animals.

14.0 ENDOSULFAN

14.1 Noncarcinogenic Effects

Information regarding the effects endosulfan in humans after inhalation exposure are limited to a few studies which report neurological effects (EEG abnormalities, convulsions, brain damage) in workers exposed to insecticides containing endosulfan (ATSDR, 1990). Exposure to endosulfan was not quantifiable in these cases. No studies were located regarding effects in animals after inhalation exposure to endosulfan.

A few case studies have reported neurological effects (hyperactivity, tremors, dyspnea, salivation, and convulsions) in humans after acute oral exposure to endosulfan (ATSDR, 1990). Doses associated with these types of effects in humans were not quantifiable. Studies in animals indicate that effects on the liver, kidneys, and reproductive system are of concern following oral exposure to endosulfan. Hepatic and renal effects such as changes in organ weight, enzyme levels, and histopathology were noted in rats administered subchronic doses of 0.15-23.4 mg/kg/day endosulfan (ATSDR, 1990). Testicular atrophy and ovarian cysts were noted in male and female mice chronically exposed to 0.46 and 0.26 mg/kg/day,

respectively (ATSDR, 1990). The USEPA derived a chronic oral RfD of 5E-5 mg/kg/day for endosulfan (USEPA, 1993). The RfD is based on a LEL of 0.15 mg/kg/day for kidney toxicity in rats (American Hoeschst, 1984). The LEL value was divided by an uncertainty factor of 1,000 to account for inter- and intraspecies variability, lack of a NOEL value, and lack of a complete database for chronic oral exposures to endosulfan. This RfD has been withdrawn from IRIS and a new one is in preparation (USEPA, 1993).

14.2 Carcinogenic Effects

Data regarding the carcinogenic effects of endosulfan in humans and animals after inhalation exposure were not located.

No studies were located regarding the carcinogenic effects of endosulfan in humans after oral exposure. Studies in rats and mice did not detect any tumor incidences in exposed animals that were elevated above controls (NCI, 1978). The USEPA has not evaluated the carcinogenicity of endosulfan (USEPA, 1993).

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15.0 ENDRIN

15.1 Noncarcinogenic Effects

The central nervous system is the primary target for inhaled endrin in humans. Symptoms such as twitching and jerking muscles, dizziness, confusion, and epileptiform seizures can occur within 2 hours following an occupational exposure. Recovery from these symptoms usually occurs 1 to 3 days after removal from exposure. Abnormal EEGs can occur without any clinical symptoms, and return to normal following 1 to 6 months after removal from the exposure. Exposure levels causing these effects were not described (ATSDR, 1989). One epidemiological study showed a significantly increased incidence of nonmalignant respiratory system disease in aldrin/dieldrin/endrin workers. However, this study is limited by the fact that exposure to other chemicals had occurred. Elevated liver function tests were found in 7/592 aldrin/dieldrin/endrin manufacturer workers (ATSDR, 1989).

One animal study was located concerning the noncarcinogenic effects of inhaled endrin. Treon et al. (1955) reported increased mortality in mice and rabbits exposed to 0.36 ppm endrin for 185 days. This effect was accompanied by signs of hepatic and renal degeneration in both species. In addition, rabbits experienced pneumonitis and signs of neurological degeneration. The USEPA has not derived an inhalation RfD or RfC due to insufficient data (USEPA, 1993).

The central nervous system is the primary target tissue in humans exposed by the oral route. Symptoms including a jerking of arms and legs, tonic-clonic contractions, convulsions and collapse. A dose of 171 mg/kg was sufficient to cause death in one human poisoning case (ATSDR, 1989).

An increased mortality rate was observed in dogs, mice, and rats at chronic oral doses ranging from 0.13 to 0.625 mg/kg/day. Dogs appear to be the most sensitive to the hepatic and neurological effects of endrin. Dogs that received 0.05 to 0.10 mg/kg/day endrin for 2 years experienced occasional convulsions, slightly increased liver weights and mild vacuolization of hepatic cells. These effects were not observed at a dose level of 0.025 mg/kg/day endrin (VCC, 1969). An earlier study confirms this NOAEL of 0.025 mg/kg/day for renal (enlarged kidney) and cardiovascular (enlarged heart) effects (Treon et al., 1955). Neurological effects (hyperexcitability and convulsions) have been observed in dogs, mice and rats at doses ranging from 0.2 to 0.6 mg/kg/day. The neurological effects were not evident at doses of 0.1 to 0.3 mg/kg/day endrin. Studies in mice and hamsters indicate that orally administered endrin can produce developmental effects. Doses ranging from 2.5 to 7 mg/kg/day caused extra ribs, fused ribs, webbed feet, and cleft palate in both species. A decreased fetal weight occurred after pregnant mice were exposed to 1 mg/kg/day endrin (ATSDR, 1989).

The USEPA has derived a chronic oral administered reference dose of 3E-4 mg/kg/day for endrin (USEPA, 1993). This value is based on the LOAEL of 0.025 mg/kg/day for hepatic and neurological effects in dogs (VCC, 1969). The RfD value was derived by dividing the LOAEL by an uncertainty factor of 100 (10 for interspecies variability, 10 for interhuman variability). Confidence in this value is judged to be medium. There are good supporting chronic data, but the lack of reproductive effect data limits a higher confidence (USEPA, 1993).

15.2 Carcinogenic Effects

Several epidemiological studies did not detect a correlation between occupational exposure to endrin and increased cancer risk. However, these studies were limited by the small number of cases and short follow-up periods (ATSDR, 1989). Data concerning the carcinogenicity of inhaled endrin in animals were not located. The USEPA has not derived an inhalation administered slope factor for endrin (USEPA, 1993).

Data concerning the carcinogenicity of ingested endrin in humans were not located. An NCI (1978) bioassay, in which mice were fed up to 5 ppm endrin and rats were fed up to 6 ppm

endrin in the diet, revealed statistically significant increased incidence of hemangiomas and adrenal tumors in male rats and pituitary and adrenal tumors in female rats. The NCI concluded this study did not provide conclusive evidence for endrin carcinogenicity due to limitations including small control groups and the high toxicity of endrin. Other studies failed to find evidence of tumors in rats, mice, and dogs given up to 100 ppm endrin in the diet (USEPA, 1993). The USEPA has not derived an oral administered slope factor for endrin (USEPA, 1993).

The USEPA has classified endrin as a Group D, not classifiable as to human carcinogenicity (USEPA, 1993). This classification was based on the suggestive evidence of the NCI (1978) study and the inadequacies of several of the bioassays.

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16.0 HEPTACHLOR/HEPTACHLOR EPOXIDE

Heptachlor epoxide is produced by metabolism of heptachlor by bacteria, animals and humans. The epoxide is generally more toxic than its parent compound (ATSDR, 1991).

16.1 Noncarcinogenic Effects

Data concerning the noncarcinogenic effects of heptachlor or heptachlor epoxide in humans after inhalation exposure are limited to a few epidemiological studies and case reports. Several studies describe effects on the blood (dyscrasia, cerebrovascular disease, arteriosclerosis). In general, these reports are limited due to lack of exposure quantification and often involve exposure to other pesticides (ATSDR, 1991). Therefore, it is difficult to define a causal relationship from these reports. Data concerning the noncarcinogenic effects

of heptachlor epoxides in animals after inhalation exposure were not located. EPA has not derived an inhalation RfC for heptachlor or heptachlor epoxide (USEPA, 1993).

Data concerning the noncarcinogenic effects of heptachlor or heptachlor epoxide in humans after oral exposure were not located. The liver is the chief target organ for heptachlor and heptachlor epoxide in animals after oral exposures. In animals, heptachlor has been better studied than heptachlor epoxide. Hepatic effects attributed to heptachlor exposure include fatty infiltration, organ weight changes, enzyme level changes, congestion and necrosis, and occur following long- term oral exposures to doses typically ranging from 2-10 mg/kg/day. Hepatic effects have been observed in mice, rats and pigs (ATSDR, 1991). In a two-year dietary study in rats, exposure to 5 ppm (0.25 mg/kg/day) heptachlor produced an increased liver in males (VCC, 1955). This study identified a no-observed-effect level (NOEL) of 3 ppm (0.15 mg/kg/day) for heptachlor. In a 60-week dog feeding study, diets containing 0.5 ppm (0.0125 mg/kg/day) heptachlor epoxide produced an increased liver-to-body-weight ratio in both sexes (DCC 1958). The EPA identified this value as a low-effect level (LEL) for heptachlor epoxide (USEPA, 1993).

The NOEL of 0.15 mg/kg/day for heptachlor (VCC, 1955) and the lowest-effect level (LEL) of 0.0125 mg/kg/day for heptachlor epoxide (DCC, 1958) were divided by the respective uncertainty factors of 300 (10 for interspecies extrapolation, 10 for intraspecies extrapolation and 3 for the lack of chronic data in a second species) and 1,000 (10 for interspecies extrapolation, 10 for intraspecies extrapolation and 10 for lack of a NOEL) to derive chronic oral RfD values of 5E-4 mg/kg/day and 1.3E-5 mg/kg/day for heptachlor and heptachlor epoxide, respectively (USEPA, 1993). Confidence in the RfD values is rated low since the quality of the critical studies and the quality of the database are both considered low (USEPA, 1993).

16.2 Carcinogenic Effects

Data concerning the carcinogenic effects of heptachlor or heptachlor epoxide in humans after inhalation exposure are limited to a few case reports and epidemiological studies. Of three epidemiological studies on workers exposed to heptachlor and/or chlordane, only one reported an elevated mortality from bladder cancer (three observed) (Wang and McMahon, 1979a). No other increased cancer mortalities have been reported (Wang and McMahon, 1979b; Ditraglia et al., 1981). Interpretation of data from these studies is limited by concomitant exposure to other chemicals and lack of dose data. Data concerning the carcinogenic effects of heptachlor or heptachlor epoxide in animals after inhalation exposure were not located. However, the EPA has derived inhalation slope factors of 4.5 and 9.1 $(mg/kg/day)^{-1}$ for heptachlor and heptachlor epoxide, respectively, based on extrapolation from oral cancer data, discussed below (USEPA, 1993).

Data concerning the carcinogenic effects of heptachlor or heptachlor epoxide in humans after oral exposure were not located. Two long-term studies in mice reported the development of liver tumors in both sexes (Davis, 1965; NCI, 1977). Similarly, four long-term studies on heptachlor epoxide reported the development of liver tumors in mice and rats (Davis, 1965;

VCC, 1973;, Witherup et al., 1959; Jolley et al., 1966). For heptachlor, cancer data from Davis (1965) were reevaluated (Epstein, 1976) and used to derive two new slope factors in male and female mice. These data were combined with the cancer data in male and female mice from NCI (1977), and the geometric mean slope factor was determined to be 4.5 $(mg/kg/day)^{-1}$ for heptachlor. Similarly, for heptachlor epoxide, cancer data in male and female mice were reevaluated (Reuber, 1977) and used to derive four new slope factors. The geometric mean of these slope factors was determined to be 9.1 $(mg/kg/day)^{-1}$ for heptachlor epoxide (USEPA, 1993). The EPA has classified heptachlor and heptachlor epoxide as Group B2, probable human carcinogens (USEPA, 1993).

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17.0 ISODRIN

No data were located regarding the noncarcinogenic or carcinogenic effects of isodrin in humans or animals.

18.0 LEAD

18.1 Noncarcinogenic Effects

Lead is a heavy metal that produces a number of adverse health effects in humans. Acute and subacute poisoning generally occurs only after ingestion of large doses of lead (in excess of 1,000 mg/day) (NAS, 1977). Encephalopathy is typically the most significant clinical manifestation, sometimes occurring quite suddenly. Signs of developing central nervous system impairment include apathy, stupor, hyperirritability, depression, headache and tremor. Other tissues that may be injured include the gastrointestinal tract, the liver, the kidneys and red blood cells (USEPA, 1986).

Instances of short-term lead poisonings in humans are now rather rare, and most health concerns center around chronic low-level exposure. Lead is retained strongly in exposed humans, and lead toxicity is cumulative. One of the characteristic effects of chronic lead exposure is hypochromic microcytic anemia, stemming from lead-induced inhibition of heme biosynthesis and a decrease in erythrocyte lifespan. Heme synthesis is inhibited not only in erythrocytes but in other tissues as well, and several key heme-containing enzymes (e.g., those required to synthesize vitamin D) show decreased activity following lead exposure (USEPA, 1986).

Chronic exposure also results in impairment of the nervous system. Many studies have shown that animals and humans are most sensitive to the effects of lead during the time of nervous system development. Thus, the fetus, infants and young children are particularly vulnerable. Symptoms of nervous system damage range from subtle decreases in intelligence and scores on neurological tests to frank encephalopathy. Effects on the nervous system are generally considered to be irreversible (USEPA, 1986). Additionally, lead exposure during pregnancy may result in decreased size and growth of the infant and may increase the chances of premature birth or other complications during pregnancy (USEPA, 1986).

Other studies have focused attention on the cardiovascular system as a target for lead. Epidemiological data from the United States reveal a strong correlation between blood pressure and the level of lead in the blood. Although the changes in blood pressure associated with moderate lead exposures are small, the increased risk of stroke or heart attack make this an effect of concern (USEPA, 1986).

It is currently difficult to identify what degree of lead exposure, if any, can be considered safe. Most studies in humans do not involve measurement of actual exposure; instead, exposure is judged by measurement of blood lead (PbB) values. Subtle signs of lead-induced effects begin to be apparent at around 10 μg/dL or even lower, with effects becoming clearer by 3,040 μg/dL. Frank clinical signs of lead toxicity are usually apparent at blood lead levels of 80,100 μg/dL. Of special concern is the claim by several researchers that some of the effects of lead (neurobehavioral effects, heme synthesis, fetal development) do not have a threshold value (USEPA, 1986).

The daily exposure to lead that produces these PbB levels cannot presently be calculated with a high degree of certainty, but it seems likely that inhalation or ingestion of only small amounts of lead per day could be of concern. Based on this, the USEPA (1988) has established a Maximum Contaminant Level Goal (MCLG) of zero for lead in drinking water. Although there is no agreed upon PbB level considered to be "safe," the USEPA has identified the range of 10 to 15 μg/dL as a range of concern for effects that warrant avoidance. USEPA has also developed a biokinetic model that predicts the expected distribution of PbB values in populations of children exposed to various lead sources (USEPA, 1989). USEPA has decided it is inappropriate to derive an RfD because some effects occur at levels so low as to be essentially without a threshold (USEPA, 1993).

18.2 Carcinogenic Effects

Studies in animals indicate that chronic oral exposure to very high doses of lead salts may cause an increased frequency of tumors of the kidney (USEPA, 1986). However, there is only limited evidence that lead is carcinogenic in humans, and the noncarcinogenic effects on the nervous system and on hematopoiesis are usually considered to be the most important and sensitive endpoints of lead toxicity (USEPA, 1988). USEPA has classified lead as a Group B2, probably human carcinogen, based on sufficient information from animal studies with inadequate information on humans (USEPA, 1993). However, slope factors for inhalation or oral exposure to lead have not been developed.

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19.0 GAMMA-HEXACHLOROCYCLOHEXANE (LINDANE)

19.1 Noncarcinogenic Effects

Occupational and accidental exposure to lindane in air is associated with a number of adverse health effects in humans, including irritation of the nose, throat, and skin, electrocardiogram abnormalities, anemia, increased serum enzyme levels (indicative of liver damage), neurological effects (paresthesia in extremities, headache, vertigo, electroencephalogram abnormalities), and changes in reproductive hormone levels (ATSDR, 1992). Exposure levels responsible for producing these effects in humans have not been reported. No data were located regarding the effects of lindane in animals after inhalation exposure. USEPA has not derived an inhalation RfC for lindane (USEPA, 1993).

Studies in laboratory animals indicate that oral exposure to lindane produces a variety of effects on the liver, kidney, central nervous system, immune system, and reproductive system. Liver effects (hepatic hypertrophy) and kidney damage (tubular degeneration, hyaline droplets, tubular distension, interstitial nephritis, and basophilic tubules) was observed in rats exposed to 1.55 mg/kg/day lindane for 12 weeks (Zoecon Corporation, 1983). These effects were rare or relatively mild in rats exposed to 0.33 mg/kg/day. Acute exposures to 3 to 60 mg/kg/day caused changes in behavior and activity, and seizures in rats (ATSDR, 1992). Antibody response was suppressed in rats and rabbits exposed to 1.5 to 6.25 mg/kg/day lindane for 5 to 6 weeks (ATSDR, 1992). Effects on the reproductive system (decreased mating receptivity, anti-estrogenicity, testicular atrophy, disrupted spermatogenesis, and degeneration of the seminiferous tubules) were noted in rats administered 20 to 75 mg/kg/day for acute and intermediate durations (ATSDR, 1992). USEPA derived a chronic oral RfD of 3E-4 mg/kg/day for lindane (USEPA, 1993), based on a NOAEL of 0.33 mg/kg/day for liver and kidney effects (Zoecon Corporation, 1983). The NOAEL value was divided by an uncertainty factor of 1,000 to account for inter- and intraspecies variability, and extrapolation from subchronic to chronic exposure. USEPA places medium confidence in the RfD value (USEPA, 1993).

19.2 Carcinogenic Effects

No data were located regarding the carcinogenic effects of lindane in humans. Several studies have reported an increased incidence of hepatocellular carcinoma in mice exposed to 4.7 to 52 mg/kg/day lindane for 80 to 104 weeks (ATSDR, 1992). USEPA has developed an oral slope factor of 1.3E+0 $(mg/kg/day)^{-1}$ for lindane based on the increased incidence of liver tumors (USEPA, 1992). The slope factor is currently under review by a USEPA workgroup and its value may change in the near future. USEPA is also considering the assignment of a weight-of-evidence classification of B2 (probable human carcinogen) or C (possible human carcinogen) for lindane based on the data from animal studies (USEPA, 1992). The carcinogenicity assessment for lindane is listed as pending on IRIS (USEPA 1993).

19.3 References

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20.0 MERCURY

The type and severity of effects from mercury ingestion are dependent on the form in which it is administered (organic versus inorganic). Therefore, these two forms will be addressed separately, below.

20.1 Noncarcinogenic Effects

Inorganic mercury (inhalation) - A few fatalities have occurred following exposure to high (unspecified air concentrations of inorganic mercury. Death was attributed to a loss of respiratory function due to extensive pulmonary tissue damage (edema, pneumonia and epithelial desquamation). Workers exposed to concentrations of 1 to 44 mg/m^3 inorganic mercury have developed chest pains, dyspnea, cough, hemoptysis, impaired pulmonary function and pneumonitis. One study reported a significant negative association between diastolic blood pressure and inorganic mercury exposure in humans. However, other studies reported an increase in blood pressure following acute exposures. Gastrointestinal symptoms such as nausea, vomiting, diarrhea, gingivitis and mercurial stomatitis are also associated with the inhalation of inorganic mercury vapor. Human case studies have revealed that the inhalation of inorganic mercury can produce mild hepatic effects (biochemical changes) and renal effects (increased creatinine excretion, proteinuria, hematuria and degeneration of the convoluted tubules). Concentrations of 1.0 mg/m^3 have produced erythematous and pruritic skin rashes, burning eyes and conjunctivitis. Short-term exposures to 44 mg/m^3 produce long lasting feelings of irritability, a lack of ambition and a lack of sexual desire.

Other neurological symptoms such as tremors, erethism, decreased motor functions, slowed peripheral nerve conduction, impaired reflexes, headaches, and abnormal EEGs are also associated with exposure to inhaled inorganic mercury (ATSDR, 1989). A few human case studies also suggest that prenatal exposure to mercury vapor can produce menstrual alterations and increased spontaneous abortions (ATSDR, 1989).

Workers at chlor-alkali factories are chronically exposed to inorganic mercury vapor. Renal effects occur at concentrations of approximately 0.1 mg/m^3. The first symptoms are mild (such as proteinuria) and are reversible. More severe damage is indicated by glomerular dysfunction, nephrotic syndrom and edema. These effects usually subside a few months after the exposure ceases. Workers exposed to inorganic mercury vapor typically complain of muscle pain, burning feet, muscle cramps, and develop a yellow haze on their lenses. Neurotoxicity (as evidenced by tremors, erethism, decreased nerve conduction velocity, impaired performance and psychomotor skills) is the critical effect for inhalation exposure to inorganic mercury (Fawer et al., 1983; Piikivi and Tolonen, 1989; Piikivi and Hanninen, 1989; Piikivi, 1989). These studies identified a NOAEL of 0.009 mg/m^3 for neurological effects of inorganic mercury.

In rats and rabbits, histopathological changes of the kidney have been reported following subchronic inhalation exposures to 0.9 to 3 mg/m^3 inorganic mercury. Necrosis of the kidney, liver and heart has also been observed in rabbits after inhalation of 0.9 to 6 mg/m^3 mercury. The same dose range has also produced neurological effects including tremors and histopathological changes and necrosis of the brain. Pigeons exhibited abnormal behavior after subchronic exposure to 17 mg/m^3 (ATSDR, 1989).

The USEPA has derived an inhalation administered RfC of 3E-4 mg/m^3 for elemental mercury (USEPA, 1992). This value is based on the NOAEL of 0.009 mg/m^3 for neurological effects in humans as described by several studies (Fawer et al., 1983; Piikivi and Tolonen, 1989; Piikivi and Hanninen, 1989; Piikivi, 1989). The NOAEL was divided by an uncertainty factor of 30 to derive the RfC. This RfC value has been verified by a USEPA workgroup, and IRIS input is pending.

Organic mercury (inhalation) - Human fatalities have been reported following exposure concentrations as low as 1 mg/m^3 diethyl mercury for 4 to 5 months (ATSDR, 1989). There is limited evidence that inhalation exposure of rats to 0.5 to 2.5 mg/m^3 inorganic mercury to rats can cause a decrease in the number of living fetuses and an increase in the number of congenital malformations and resorptions (ATSDR, 1989). The USEPA has not derived an inhalation RfC or RfD for organic mercury (USEPA, 1993).

Inorganic mercury (ingestion) - Oral doses of 29 to 50 mg/kg of inorganic mercury have produced fatalities in humans. Death is attributed to shock, cardiovascular collapse, renal failure and severe gastrointestinal damage. Therapeutic administration of mercury salts (for its diuretic and antiseptic properties) has resulted in nephrotic syndrome (albuminuria, hypoalbuminemia, edema and hypercholesterolemia) after a single dose of 21.4 mg/kg. Renal failure and neurological effects, including a decreased brain weight and a decreased cerebellar cell number, were reported in two human case studies involving the consumption of 3.4 mg/kg/day mercurous chloride for 6 to 25 years in the form of a laxative pill (ATSDR, 1989).

In animals, subchronic oral exposure to inorganic mercury has produced effects on the renal, immunological and neurological systems. Degenerative changes to the neurons of the dorsal

route ganglia and cerebellar granule cells accompainied by ataxia, sensory loss and decreased body weight were noted in rats given oral doses of 0.8 mg/kg/day mercury as mercurous chloride for 1 to 11 weeks. A suppression of the lymphoproliferative response has been reported in mice following ingestion of 2.1 mg/kg/day for 7 weeks. Several oral and parental studies on Brown-Norway rats identify 0.3 mg/kg/day as the LOAEL for the renal effects (glomerulonephritis) of inorganic mercury (Druet et al., 1978; Bernaudin et al., 1981; and Andres, 1984). There is sufficient evidence to indicate that the renal damage is mediated through an immune-type mechanism (ATSDR, 1989). Pregnant hamsters given a single dose of 31.4 mg/kg inorganic mercury had an increased percentage of fetal resorptions compared to unexposed hamsters (ATSDR, 1989).

The USEPA has derived an oral administered RfD of 3E-4 mg/kg/day for inorganic mercury (USEPA, 1991a,c). This value is based on the LOAEL of 0.3 mg/kg/day for renal effects in Brown-Norway rats identified by several studies (Druet et al., 1978; Bernaudin et al., 1981; Andres, 1984). The LOAEL was divided by an uncertainty factor of 1,000 (10 for interspecies variability, 10 for intrahuman variability, and 10 for the use of a LOAEL) to derive the RfD. This RfD has been verified by a USEPA workgroup, however, its input into IRIS is still pending (USEPA, 1992).

Organic mercury (ingestion) - The nervous system is the primary target for the effects of orally administered organic mercury. In addition, organic mercury can also produce effects on the renal and cardiovascular systems. Estimated doses, based on tissue concentrations in human fatality cases, range from 10 to 60 mg/kg/day. Abnormal renal function (polyuria, polydypsia and albuminuria) were reported in humans following ingestion of ethyl mercury. Consumption of methylmercury in contaminated fish or grain has produced a variety of neurological symptoms in humans, including tingling extremities, impaired senses, slurred speech, incoordination, weakness, memory loss, depression, insomnia and death due to central nervous system failure (ATSDR, 1989).

In rats, renal effects (tubular damage, fibrosis and inflammation) have been reported after oral exposure to 0.08 to 0.84 mg/kg/day organic mercury for 1 to 12 weeks, and at 0.015 mg/kg/day for chronic exposures. An increase in systolic blood pressure was noted in rats given 0.4 mg/kg/day organic mercury by gavage for 3 to 4 weeks. Animal studies have revealed that methyl mercury is a more potent neurotoxin than inorganic mercury. Neurological effects (degenerative changes, particularly in the cerebellum, behavioral changes, depressed dopamine synthesis) were reported in cats and mice at doses ranging from 0.015 to 0.8 mg/kg/day, and in rats at doses ranging from 0.7 to 3.2 mg/kg/day organic mercury (ATSDR, 1989). Impaired spatial vision, reduced visual sensitivity, intention tremors, somesthetic impairment and incoordination were noted in monkeys given 0.04 to 0.48 mg/kg/day for 3 to 4 years (ATSDR, 1989). Developmental effects including fetal eye anomalies, neurotoxicity, and behavioral changes have been reported in the offspring of rats exposed to doses of 0.008 to 0.25 mg/kg/day organic mercury during gestation. Signs of fetotoxicity, fetal death and decreased male fertility have been noted in mice and rats at doses ranging from 1 to 5 mg/kg/day organic mercury (ATSDR, 1989).

The USEPA has not derived an oral RfD for organic mercury (ATSDR, 1993).

20.2 Carcinogenic Effects

Data concerning the carcinogenicity of inhaled or ingested mercury (organic or inorganic) in humans were not located in the literature cited in the reference section. Limited animal studies do not indicate any carcinogenic effect for mercury. The USEPA has classified mercury as Group D, not classifiable as to human carcinogenicity (USEPA, 1993).

20.3 Beneficial Effects

The Food and Nutrition Board does not recognize mercury as an essential trace mineral, and no recommended dietary allowance has been established (FNB, 1989).

20.4 References

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21.0 NICKEL

21.1 Noncarcinogenic Effects

Long-term inhalation of nickel compounds can lead to lung injury. In workers exposed on the job (welders, nickel platers), reported symptoms include asthma, loss of the sense of smell and nasal irritation and injury (ATSDR, 1991). The exposure levels causing these effects are not know, but are presumably much higher than commonly encountered in the environment. Similar injuries to the respiratory tract have been observed in animals exposed to aerosols of nickel compounds at concentrations of about 0.1 to 1. mg/m^3 (ATSDR, 1991). ATSDR (1991) has estimated a minimal risk level of 0.0005 mg/m^3. This value is based on a NOAEL of 0.05 mg/m^3 for decreased alveolar macrophage activity in rats (Spiegelberg et al., 1984). The NOAEL was divided by an uncertainty factor of 100 to account for inter- and intraspecies variability. An inhalation RfD for nickel is under review by an USEPA workgroup (USEPA, 1993).

Data concerning the toxicity of ingested nickel in humans were not located. Altered thyroid function has been observed in rats after ingesting 0.5 to 5 mg/kg-day. Other animal studies indicate that nickel can effect carbohydrate metabolism by antagonizing the hypoglycemic action of insulin (ATSDR, 1991). High oral doses (greater than 5 mg/kg-day) have been observed to cause decreased growth in several animal studies (Ambrose et al., 1976; American Biogenics Corporation, 1986). There is limited evidence that ~~high oral~~ doses during pregnancy can have fetotoxic effects (Ambrose et al., 1976; RTI, 1987), but the NOAEL of 5 mg/kg-day identified by Ambrose et al. (1976) is believed to be protective for this effect (USEPA, 1993). Based on a NOAEL of 5 mg/kg-day identified in a two-year feeding study in rats using nickel sulfate (Ambrose et al., 1976), the USEPA has calculated a chronic oral RfD of 0.02 mg/kg-day (USEPA, 1993). The NOAEL was divided by an uncertainty factor of 100 to account for inter- and intraspecies variability, plus an additional modifying factor of 3 to account for insufficient information on reproductive/development effect. Confidence in the RfD is rated medium since the NOAEL is supported by two animal studies (USEPA, 1993).

21.2 Carcinogenic Effects

There is good evidence that chronic inhalation exposure to nickel can cause tumors of the respiratory tract. In humans, several epidemiological studies indicate that occupational exposure to nickel refinery dust (composed of approximately 50% nickel subsulfide and small amounts of nickel sulfate and nickel oxide) leads to increased risk of lung cancer and nasal

cancer (Chovil et al., 1981; Roberts et al., 1983; Peto et al., 1984; Roberts and Julian, 1982; Enterline and Marsh, 1982, Magnus et al., 1982). This is supported by a long-term inhalation study in rats, where exposure to 1 mg/m^3 nickel subsulfide led to an increased incidence of lung tumors (Ottolenghi et al., 1974). Based on these studies, the USEPA has ranked nickel refinery dust and nickel subsulfide as a Group A (human carcinogen) by the inhalation route and has calculated an inhalation slope factor of 8.4E-1 (mg/kg-day)$^{-1}$ for nickel refinery dust and 1.7E+0 (mg/kg-day)$^{-1}$ for nickel subsulfide (USEPA, 1993). The dose-response data for nasal cancer was not used in the derivation of these slope factors because these tumors are considered to be an occupational hazard associated only with pyrometallusical processes. It is not known which nickel species in refinery dust is responsible for the carcinogenic effects.

There is no evidence that nickel is carcinogenic by the oral route; however, data are inadequate to conclude that nickel and inorganic nickel compounds are not carcinogenic. There are no human data. Animal studies in rats, mice and dogs observed no treatment-related tumor increases (ATSDR, 1991). The USEPA has not assigned a weight-of-evidence classification for nickel exposure by the oral route.

21.3 Beneficial Effects

Small amounts of nickel appear to be essential for normal growth and reproduction in some animal species. Based on this, it is possible that small doses may also be beneficial in humans. On the basis of available information a human requirement has not been established (NAS, 1989).

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22.0 NITRATE/NITRITE

Nitrate and nitrite are naturally occurring inorganic ions. Nitrate can be converted to nitrite in the body, particularly by bacteria in the alimentary canal. Therefore, the effects of these two ions are discussed together.

22.1 Noncarcinogenic Effects

Data concerning the toxicity of inhaled nitrate or nitrite in humans or animals were not located.

Studies in humans and animals indicate that the chief adverse effect of nitrate and nitrite is the production of methemoglobinemia. Nitrate must first be converted to nitrite to produce this effect. Nitrite oxidizes the Fe^{+2} form of iron in hemoglobin to Fe^{+3}, forming methemoglobin. Methemoglobin can not bind oxygen normally, therefore the oxygen-carrying capacity of the blood is reduced. Typical blood levels of methemoglobin range from 0.5 to 2%. Levels below 10% are not associated with any adverse effects. Levels above 10% may result in cyanosis whereas levels as high as 25% can produce weakness, rapid pulse and tachypnea (USEPA, 1993).

Infants appear to be particulary sensitive to the methemoglobin-forming effects of nitrate. This sensitivity is due to a higher pH in the stomach of infants which allows for a larger bacteria population (USEPA, 1990). Bosch et al., (1950) evaluated 139 cases of cyanosis in children (8 days to 5 months old) caused by nitrate contaminated wells. All wells contained greater than 10 mg/L nitrate-nitrogen. In 214 cases of infantile methemoglobinemia, Walton et al., (1951) reported all were due to consumption of water with levels of 11 mg/L or more nitrate-nitrogen. Based on estimates of accidental exposures, older children and adults require doses of 8 to 12 mg/kg nitrite-nitrogen to produce methemoglobinemia (USEPA, 1990). Two epidemiological studies reported an increased risk of birth defects (2.3 to 2.8)

in subpopulations with elevated levels of nitrate in the drinking water (5 to 15 mg/L and 1.3 to 26 ppm) (USEPA, 1990).

In rats, oral doses of 40 to 80 mg/kg/day nitrate or nitrite-nitrogen resulted in methemoglobinemia. Pregnant rats may be more susceptible since a single dose of 0.5 to 6 mg/kg nitrite-nitrogen was sufficient to produce up to 60% methemoglobin (USEPA, 1990). Altered thyroid weight and function has been observed in rats and pigs at higher doses of nitrate-nitrogen. Nitrite has also produced a reduction in life span and damage to the liver, lung, spleen, kidney and adrenals of mice or rats (USEPA, 1990). In general, doses of 2 to 10 mg/kg/day nitrite-nitrogen did not result in ay developmental or reproductive effects in animals. However, higher doses (12 to 90 mg/kg/day nitrite-nitrogen) have resulted in decreased reproduction and sperm abnormalities in the parents, and increased mortality, decreased body weight, liver and spleen damage and anemia in their offspring. A few studies have noted behavioral changes in the offspring at doses as low as 1.7 mg/kg/day nitrate-nitrogen or 2.5 mg/kg/day nitrite-nitrogen (USEPA, 1990).

The USEPA has calculated an oral RfD of 1.6E+0 mg/kg/day for nitrate-nitrogen and 1E-1 mg/kg/day for nitrite-nitrogen (USEPA, 1993). These values are based on the NOAEL of 10 mg/L nitrate-nitrogen for infantile methemoglobinemia as reported by Bosch et al., (1950) and Walton (1951). The NOAEL was adjusted for daily water intake (0.64-1 L) and infant body weight (4 to 10 kg). The use of an uncertainty factor was not necessary since the critical studies identified the NOAEL in the most sensitive human subpopulation, however, a modifying factor of 10 was used for nitrite-nitrogen to account for the direct toxicity of nitrite. Confidence in these values is rated high since there are a large number of good supporting human and animal studies (USEPA, 1993).

22.2 Carcinogenic Effects

By themselves, studies on the carcinogenicity of nitrate or nitrite have been negative or equivocal. The primary reason for concern regarding carcinogenicity lies in the ability of the nitrite to react with secondary and tertiary amines (commonly found in the diet) to form carcinogenic nitroamines. A number of animal studies have shown that nitrite, when fed concurrently with a nitrosatable amine, yields an increased incidence of tumors in a number of tissues including the lungs, esophagus, stomach, tongue, nasal cavity and liver (USEPA, 1990). A carcinogenicity assessment is currently listed as pending in IRIS (USEPA, 1993).

22.3 References

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23.0 POLYCHLORINATED BIPHENYLS

Polychlorinated biphenyls (PCBs) are a group of structurally related compounds characterized by two phenyl groups joined by a carbon-carbon bond. Individual compounds differ in the number (congeners) and location (isomers) of chlorine substitutions. Commercial formulations of PCBs (Aroclors) are complex mixtures of numerous isomers and congeners. Toxicity studies on these commercial mixtures are complicated by the fact that composition may vary from batch to batch, and trace impurities (dibenzodioxins) may account for some of the observed adverse health effects.

23.1 Noncarcinogenic Effects

In humans, PCBs cause a similar spectrum of toxic effects following oral, inhalation or dermal exposures. Chloracne is the most commonly reported dermatological symptom. The liver is the major target organ following oral exposures; decreases in pulmonary function and respiratory and eye irritation have been reported in capacitor manufacturing workers following inhalation exposures (USEPA, 1988). However, it is not clear these effects are caused solely by PCB exposures or to polychlorinated dibenzofurans which commonly contaminate PCB mixtures.

The liver and skin are target organs for PCBs in animals. In rats fed a variety of Aroclors for four weeks to eight months, degenerative liver effects were reported (Bruckner et al., 1974, Kimbrough et al., 1972). The no-observed-adverse-effect level from these studies is estimated at 0.025 mg/kg-day (ATSDR, 1991). Several studies in monkeys observed similar hepatic effects, chloracne and gastric lesions. The lowest effect level in that study was estimated to be 0.105 mg/kg-day (ATSDR, 1991). Reduced birth weights were noted in the offspring of monkey exposed to 1 ppm Aroclor 1016 (0.028 mg/kg-day) (Barsotti and van Miller, 1984; Levi et al., 1988; Schantz et al., 1989, 1991). The USEPA used this NOAEL of 0.25 ppm (0.007 mg/kg-day) from this series of studies to derive a chronic oral RfD of 7.0E-05 mg/kg-day. The NOAEL was divided by an uncertainty factor of 100 to account for inter- and intraspecies variability. The USEPA places medium confidence in this RfD when it is applied to PCB mixtures of different congeners, and high confidence when it is applied to PCB mixtures that match the pattern of congeners in Aroclor 1016 (USEPA, 1993).

Application of Aroclor 1260 to the skin of rabbits produced degenerative lesions in both the kidneys and liver and hyperplasia and hyperkeratosis of the epidermal epithelium (Vos and Beems, 1971). The dose that produced these effects was approximately 44 mg/kg-day (ATSDR, 1991). As with the other routes, inhalation exposures to cats, rats, mice, rabbits and guinea pigs at a level of 1.5 mg/m^3 Aroclor 1254 produced degenerative liver lesions (Treon et al., 1956). A similar experiment with Aroclor 1242 at a higher level did not produce these effects, therefore, a minimal risk level was not derived (ATSDR, 1991).

23.2 Carcinogenic Effects

Limited epidemiological evidence suggests that exposure of humans to PCBs may result in liver cancer by all routes of exposure. However, interpretation of studies involving human exposures are confounded by simultaneous exposures to other chemicals or lack of information as to the actual exposure levels, and, therefore, evidence for carcinogenicity in humans is judged to be inadequate (USEPA, 1993).

Animal feeding studies demonstrate the carcinogenicity of commercial PCB mixtures (USEPA, 1993). Norback and Weltman (1985) fed rats Aroclor 1260 for two years and noted a statistically significant increase in hepatocellular carcinomas. A concurrent liver morphology study demonstrated a progression from liver lesions to hepatocellular carcinomas as the study progressed. The USEPA employed the data from this study to calculate an oral slope factor of 7.7 $(mg/kg\text{-}day)^{-1}$. This is based on the incidence of both malignant tumors and neoplastic nodules. Evidence for carcinogenicity of less highly chlorinated Aroclor mixtures is limited, but the USEPA recommends application of this slope factor to all PCB mixtures. The USEPA has classified PCBs as Group B2, probable human carcinogen (USEPA, 1993).

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24.0 POLYCYCLIC AROMATIC HYDROCARBONS

Polycyclic or polynuclear aromatic hydrocarbons (PAHs) are a broad class of related compounds characterized by the presence of two or more fused aromatic rings. Individual PAHs vary considerably in their chemical structure, and differences in toxicity or potency exist among different compounds.

24.1 Noncarcinogenic Effects

Data on noncancer effects of PAHs in humans are mainly limited to observations following exposures to naphthalene. Based on case studies in infants, children, and adults, the primary health effect of naphthalene appears to be hemolytic anemia (ATSDR, 1990a). This effect has been noted following inhalation, oral, and dermal exposures, but dose response data are not available. Other noncancer effects of naphthalene which have been reported in humans exposed by the oral and/or inhalation routes include gastrointestinal distress, confusion, jaundice, renal disease, and cataracts (ATSDR, 1990a). Direct dermal contact with naphthalene may cause regressive venucae (Cottini and Mazzone, 1939; Rhoads et al., 1954).

In animals, hemolytic effects were not observed in rats or mice exposed to naphthalene (Shopp et al., 1984) but were observed in dogs (Zuelzer and Apt, 1949). Hepatic effects, including increased liver weight and increased serum enzyme activity, were reported in rats administered naphthalene at orally at doses of 1,000 mg/kg-day (Rao and Pandya, 1981). Plasterer et al., (1985) reported a decrease in the number of live pups per litter in mice dosed with 300 mg/kg-day naphthalene in corn oil during pregnancy. Cataracts were

observed in rabbits and rats after oral administration of naphthalene at 1,000 mg/kg-day (Yamauchi et al., 1986; Rossa and Pau, 1988). In a subchronic (90-day) oral study in rats, NTP (1980) identified a NOAEL for naphthalene of 35.7 mg/kg-day. This value is strongly supported by a NOAEL of 41 mg/kg-day identified in a chronic oral exposure study in rats (Schmahl, 1955). Based on the NOAEL of 35.7, the USEPA has derived an oral RfD for naphthalene of 4E-02. This was calculated using an uncertainty factor of 1,000 to account for inter- and intraspecies variability, use of a subchronic study, and for uncertainty regarding the lack of data for species that are sensitive to cataract formation and hemolytic anemia (USEPA, 1992). This RfD is currently under review by an RfD workgroup (USEPA, 1993).

The USEPA has derived oral RfD values for several other PAHs based on 90-day studies in mice (USEPA, 1988, 1989b, 1989c, 1989d, 1989e). The effects noted included hepatotoxicity (300 mg/kg/day of acenaphthene), nephropathy (250 mg/kg/day of fluoranthene or 125 mg/kg/day of pyrene) and hematological effects (250 mg/kg/day of fluorene). No effects were reported following doses of up to 1,000 mg/kg/day of anthracene (USEPA, 1989b, 1989c, 1989d, 1989e, 1988). The oral RfD values derived for these PAHs are listed below, along with their corresponding NOAEL/LOAEL values, uncertainty factors, confidence and references. An uncertainty factor of 3,000 was used to account for inter- and intraspecies variability, less than lifetime exposure and the lack of toxicity data in a second species, and confidence in these values was rated low (USEPA, 1993).

Chemical	NOAEL (mg/kg/day)	UF	RfD (mg/kg/day)	Confidence	Study
Naphthalene	35.7	1,000	4E-2	Medium	NTP 1980
Acenaphthene	175	3,000	6E-2	Low	EPA 1989
Anthracene	1,000	3,000	3E-1	Low	EPA 1989
Fluoranthene	125	3,000	4E-2	Low	EPA 1988
Fluorene	125	3,000	4E-2	Low	EPA 1989
Pyrene	75	3,000	3E-2	Low	EPA 1989

In order to estimate noncancer risks from other PAHs, it is necessary to extrapolate from the values above. On the basis of structural similarities, the RfD for acenaphthene can be applied to acenaphthylene, the RfD for naphthalene can be applied to 2-methylnaphthalene, and the RfD for pyrene can be applied to all PAHs which contain 3 or more rings.

24.2 Carcinogenic Effects

There is substantial evidence from animal and human studies that many PAHs are carcinogenic. Human data are derived mainly from studies of workers exposed to coke-oven emissions, tars, soots and oils, which contain a mixture of PAHs. The main exposure route in these workers is inhalation, and the main effect is increased incidence of lung cancer

(Mazumdar et al., 1975; Redmond et al., 1976). This is supported by several studies in animals, where increased incidence of respiratory tract tumors occurred following chronic inhalation exposure to benzo(a)pyrene or mixtures of PAHs (Thyssen et al., 1981; Dahl et al., 1985). Recent studies have reported some evidence of carcinogenic activity for naphthalene in the lungs of female mice exposed via inhalation (NTP, 1992), and in the lungs of male mice exposed to 1-methylnaphthalene by the oral route (Murata et al., 1993).

Cancer has not been reported in humans following oral exposure to PAHs, but a number of studies in animals indicate that ingestion of benzo(a)pyrene or other PAHs can lead to tumors of the stomach (Brune et al., 1981; Neal and Ridgon, 1967; Snell and Stewart, 1962). There are also a number of animal studies which demonstrate repeated dermal contact with benzo(a)pyrene or other PAHs leads to increased incidence of skin tumors (ATSDR, 1987, 1990b).

Based on these studies, it appears that the greatest risk of carcinogenic effect from PAHs is at the point of contact, i.e., lung cancer following inhalation exposure, stomach cancer following oral exposure and skin cancer following dermal exposure. This is probably because the PAHs are readily metabolized at the point of contact and that metabolic intermediates are responsible for the carcinogenic response (ATSDR, 1990a).

It is important to stress that not all PAHs have been found to be carcinogenic. The PAHs which have been ranked as probable human carcinogens (Group B2) by the USEPA include:

Benzo(a)anthracene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene
Dibenz(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Chrysene

All other PAHs have been ranked as Group D (not classifiable as to human carcinogenicity) or have not yet been classified. However, it should be noted that certain aminated or nitrosylated derivatives of some of the noncarcinogenic PAHs are carcinogenic (e.g., 2-aminofluorene, 2-naphthylamine, 1-nitropyrene).

Data are too limited to permit quantitative evaluation of cancer risk for any of the PAHs except benzo(a)pyrene. For benzo(a)pyrene, the USEPA proposed a cancer slope factor of 7.3E+00 $(mg/kg\text{-}day)^{-1}$ for oral exposures (USEPA, 1993). This value is based on a chronic benzo(a)pyrene feeding studies in rats (Brune et al., 1981; Neal and Rigdon, 1967.) An inhalation slope factor of 6.1 $(mg/kg\text{-}day)^{-1}$ based on the data of Thyssen et al., (1981) has judged to be unacceptable by USEPA.

In general, there are two approaches by which cancer risk can be estimated for carcinogenic PAHs which lack slope factors. The most conservative approach is simply to assume that all

such PAHs are as potent as benzo(a)pyrene. An alternative approach is to assign a relative potency factor (RPF) to each carcinogenic PAH, based on in vivo and in vitro structure-activity relationship studies (Chu and Chen, 1983; USEPA, 1989a). By the second approach, benzo(a)fluoranthene and dibenzo(a,h)anthracene are judged to be as potent as benzo(a)pyrene (RPF=1). Benzo(a)anthracene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and chrysene were all determined to be about 1% as potent as benzo(a)pyrene (RPF = 0.01).

24.3 References

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25.0 SILVER

25.1 Noncarcinogenic Effects

One human case study reported respiratory effects (crepitation during breathing, rapid pulse, low capillary oxygen, thickening of the lungs and respiratory failure) in an individual after working with molten silver for 14 hours (air concentrations were not determined) (ATSDR, 1990). Occupational exposures to 0.039 to 0.378 mg/m^3 silver for 1 to 10 years have resulted in complaints of upper respiratory tract irritation (sneezing, stuffiness, running nose, sore throat and cough), a burning abdominal pain, granular deposits in the cornea and conjunctiva, and an increased urinary excretion of enzymes indicative of impaired renal function (ATSDR, 1990). Data concerning the toxicity of inhaled silver in animals were not located. The USEPA has not derived an inhalation administered RfC or RfD for silver due to insufficient data (USEPA, 1993).

A bluish-gray discoloration of the skin (argyria) has also been described in individuals exposed to low oral doses of silver over a period of months to years. The resulting pigmentation primarily occurs in the skin of sun-exposed regions. Microscopic examination of the skin reveals the presence of silver-containing granules, primarily located in the basement membranes and elastic fibers surrounding sweat glands (ATSDR, 1990). Although argyria is associated with discoloration of the skin, no significant adverse health effects are believed to result. In addition, a few reports describe the deposition of silver-containing granules in certain areas of the brain of individuals exposed to silver nitrate in nose drops.

However, this observation is limited by the fact that only certain areas of the brain were investigated and the significance of these granules has not been established in humans.

In rats, decreased weight gain and increased mortality have been observed following the oral administration of 222 to 362 mg/kg/day of silver. One mouse study determined that animals exposed to 18 mg/kg/day silver as silver nitrate developed silver deposits in the brain and had lower activity levels than unexposed controls. Discoloration of the skin has also been demonstrated in rats at subchronic oral doses of 63.5 to 65 mg/kg/day for 10 to 30 weeks (ATSDR, 1990; USEPA, 1985). A discoloration of the eyes has been noted in rats after exposure to 3.2 to 9.4 mg/kg/day for up to 553 days. Clinical deterioration was reported in rats given 130 mg/kg/day in the drinking water for 76 weeks (EPA, 1985).

The USEPA has derived a chronic oral RfD of 5.0E-3 mg/kg/day for silver (USEPA, 1993). This value is based on the LOAEL for argyria in humans of 1 gram as identified by an intravenous administration study (Gaul and Staud, 1935). This dose was adjusted for absorption (divided by 0.04), body weight (divided by 70 kg), duration (divided by 25,500 days) and conversion of grams to milligrams (multiplied by 1,000) to yield a LOAEL of 0.014. An uncertainty factor of 3 was used to protect sensitive individuals. A full factor of 10 was not considered necessary since the study was on human subjects, not all subjects developed argyria at this dose and the critical effect is not necessarily adverse. Confidence in this value is rated medium to low since the study was adequately done but it was not truly an oral study and the quality of the database was low (EPA, 1991).

25.2 Carcinogenic Effects

Data concerning the carcinogenicity of inhaled or ingested silver in humans or animals were not located. A few limited implantation and injection studies have reported an increased incidence of tumors at the site of injection or implantation. However, these studies contain flawed methodologies, therefore the USEPA does not consider them to be demonstrative of a carcinogenic effect (USEPA, 1993). The USEPA has classified silver as Group D, not classifiable as to human carcinogenicity (USEPA, 1993). This decision was based on the lack of information in animals and humans regarding carcinogenicity via oral, inhalation, or dermal routes, and the inadequacy of the injection/implantation studies.

25.3 Beneficial Effects

The Food and Nutrition Board does not recognize silver as an essential trace element, and no recommended dietary allowance has been established (FNB, 1989).

25.4 References

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26.0 SULFIDE

No data were located regarding the noncarcinogenic or carcinogenic effects of sulfide in humans or animals.

27.0 TETRACHLOROETHYLENE

27.1 Noncarcinogenic Effects

Tetrachloroethylene (also known as perchloroethylene, PCE, "perc") is a volatile liquid widely used as a dry cleaning fluid and as an industrial solvent. Humans exposed to relatively high levels of PCE vapors (e.g., 100 ppm or above), may experience headaches, dizziness and other signs of central nervous system depression, but CNS effects are not usually apparent at levels below about 50 ppm (ATSDR, 1991). Inhalation of PCE may also lead to liver injury. Severe cases may lead to cirrhosis or toxic hepatitis, while milder cases are characterized by hepatomegaly, fatty degeneration and elevated levels of liver enzymes in blood (ATSDR, 1991). Although the exposure levels leading to these effects in humans are not known, studies in animals indicate the threshold is probably about 100 to 200 ppm (ATSDR, 1991). Kjellstrand et al., (1984) noted elevated liver weights in mice exposed to 9 ppm for 30 days. Hepatocellular vacuolization and enlargement were noted at 75 ppm. Renal effects (cloudy swelling of the tubules) have been reported in animals, exposed to PCE in air, and a few case studies suggest that acute exposures can also produce renal injury in humans. However, it appears that these effects only occur at levels higher than those which cause nervous system and hepatic effects (ATSDR, 1991). The USEPA has not yet derived any inhalation RfDs for PCE, but ATSDR has identified subchronic inhalation Minimal Risk Level (MRL) of about 0.009 ppm (1.7E-2 mg/kg/day) based on the hepatic effects in mice (Kjellstrand et al., 1984). The LOAEL value of 9 ppm was divided by an uncertainty factor of 1,000 to account for inter- and intraspecies variability, and for use of a LOAEL (ATSDR, 1990).

Oral doses of 60 to 86 mg/kg/day given as an anthelminthic have produced narcotic effects, inebriation and exhilaration in humans (ATSDR, 1991). Humans are rarely exposed to high

levels of PCE by the oral route, although a few case reports indicate that large oral doses can produce neurological and hepatic effects similar to those produced by inhalation exposure. This is supported by studies in animals, where oral exposure to PCE causes increased liver weight, fatty degeneration and necrosis at dose levels of 70 mg/kg/day or higher (ATSDR, 1991). Based on a no-effect-level of 14 mg/kg/day reported in mice for hepatotoxicity (Buben and O'Flaherty, 1985), the USEPA has calculated a subchronic oral RfD of 1E-1 mg/kg/day and a chronic oral RfD of 1E-2 mg/kg/day (USEPA, 1992a, 1993). The NOAEL was divided by an uncertainty factor of 1,000 to account for inter- and intraspecies variability, and for the less-than-lifetime exposure period. Confidence in these RfD values is only medium, because complete histological examinations were not performed in the study that identified the no-effect-level, and because there is limited information on reproductive and developmental effects of PCE (USEPA, 1993).

27.2 Carcinogenic Effects

Studies of cancer in humans (mainly dry cleaners) exposed to above-average levels of PCE have either been ambiguous or negative (ATSDR, 1991). However, studies in animals reveal that PCE can cause cancer either by inhalation (NTP, 1986) or oral exposure (NCI, 1977). The principal tumorigenic responses are hepatocellular carcinomas in mice and renal tumors in male rats. On the basis of these studies, the USEPA has calculated inhalation and oral slope factors of 2.0E-3 and 5.2E-2 $(mg/kg/day)^{-1}$, respectively. These slope factors have been withdrawn pending the resolution of the weight-of-evidence classification (B2 or C) (USEPA, 1992b).

The conclusion that PCE is a probable human carcinogen has been questioned, since there is evidence that both the liver tumors in mice and the renal tumors in male rats may be mediated by mechanisms that do not apply in humans. Specifically, the hepatic tumors in mice may be mediated by a proliferation of peroxysomes that is stimulated by the production of trichloroacetic acid during PCE metabolism (Odum et al., 1988). However, humans metabolize PCE to trichloroacetic acid more slowly than mice, and the human liver does not undergo peroxisome proliferation as readily as mice. Thus, humans may be much less susceptible to the hepatocarcinogenic effects of PCE than mice (Odum et al., 1988). Similarly, the production of renal tumors in male rats may be mediated by accumulation of a specific protein ($\propto$-2μ-globulin) that does not exist in humans (Goldsworthy et al., 1988).

27.3 References

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28.0 TETRAZENE

No data were located regarding the noncarcinogenic or carcinogenic effects of tetrazene in humans or animals.

29.0 THORIUM

29.1 Noncarcinogenic Effects

Since thorium is a radioactive element, adverse effects produced by thorium exposure may be a result of the chemical and/or radiological properties of thorium (ATSDR, 1990). Therefore, doses will be expressed as mg or nCi. The conversion factor between these units is 1 nCi = 9.1 mg.

An epidemiological study of thorium processing plant workers did not find any significant excess mortality. Air concentrations of thorium typically range from 0.03 to 1.75 mg/m^3 (0.003 to 0.192 nCi/m^3). Although the risk for respiratory disease has been reported to be as high as 1.31, the increase may be explained in part by smoking. The levels of specific serum enzymes indicative of a hepatic effect were significantly higher in those workers who had higher body burdens of radioactivity (due to longer exposure periods). Since most of these workers were also exposed to other toxic compounds including other radioactive metals any effects noted can not be directly attributed to thorium (ATSDR, 1990).

Hall et al. (1951) noted a decreased red blood cell count in rats after they were exposed to 8.3 mg/m^3 (0.9 nCi/m^3). In rats, Likhachev et al. (1973a) reported that intermittent exposures to an aerosol of thorium dioxide for up to 2 years, produced cirrhosis of the lungs. The severity of this effect was dependent on the radioactivity of the dose. Another study did not report any adverse effects on the respiratory, hematological, hepatic, skeletal, and renal systems or the mortality of rats, guinea pigs, rabbits, and dogs following a 1 year exposure to 50.1 mg/m^3 (0.55 nCi/m^3) (Hodge et al., 1960). The USEPA has not derived a chronic inhalation RfC for thorium (USEPA, 1992).

Data concerning the toxicity of ingested thorium in humans were not located. Very little information is available on the effects in animals. A 4-month exposure to 109 mg/kg/day (12 nCi/kg/day) thorium produced an increased mortality rate in mice (Patrick and Cross, 1959). In rats, an oral dose of 3,050 mg/kg/day (335 nCi/kg/day) for 4 months did not produce any effects on the respiratory, cardiovascular, gastrointestinal, hematological, hepatic, reproductive or renal effects. However weight loss was noted in rats at this dose (Downs et al., 1959). The USEPA has not derived a chronic oral RfD for thorium (USEPA, 1992).

29.2 Carcinogenic Effects

An excess of deaths from pancreatic, lung, and lymphatic/hematopoietic cancers has been reported in a few epidemiological studies (ATSDR, 1990). Six deaths from pancreatic cancer compared to 1.3 deaths expected were reported by Stenhey et al. (1980) in a group of workers exposed to 0.03 to 1.75 mg/m^3 (0.003-0.192 nCi/m^3) for 1 year or more. A statistically significant increased incidence of lymphatic and hematopoietic cancers were noted by Archer et al. (1973) in uranium mill workers. Radioactivity in the tracheobronchial lymph nodes was more indicative of thorium-230 exposure than uranium, therefore the

authors suggested that thorium may be the causative agent. Another study indicated a nonstatistically significant increase in lung cancer deaths (SMR=1.44) in thorium processing plant workers. Since all of the studies involved exposures to other chemicals and were complicated by smoking habits, it is difficult to make a conclusion on the relationship between thorium exposure and cancer (ATSDR, 1990).

One animal study (Likhachev et al., 1973b) reported the development of lung tumors following inhalation exposure to thorium. The type of tumors noted was dependent on the radioactivity of the dose administered. Exposures of up to 150 rad produced mainly reticulosarcomas, whereas doses of 1,000 to 2,700 rads resulted in primarily glandular tumors. The USEPA has derived for thorium-232 based on its radioactivity (USEPA, 1992).

Data concerning the carcinogenicity of ingested thorium in humans or animals were not located.

The USEPA has derived an oral slope factor of 1.2E-11 (risk/pCi), an inhalation slope factor of 2.8E-8 (risk/pCi), and an external exposure slope factor of 2.6E-11 (risk/yr per pCi/g soil) for thorium-232 based on its radioactivity (USEPA, 1992). The USEPA classifies all radionuclides as group A (human carcinogen) based on their property of emitting ionizing radiation (USEPA, 1992).

29.3 Beneficial Effects

The Food and Nutrition Board does not consider thorium to be an essential trace mineral, and therefore no RDA has been established (FNB, 1989).

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30.0 TRICHLOROETHYLENE

30.1 Noncarcinogenic Effects

Inhalation exposure of humans to trichloroethylene (TCE) has resulted in effects on the central nervous system, liver, kidney and hematological system. Deaths have been reported following acute accidental exposure to TCE in the workplace, although quantitative estimates of exposure are not available (ATSDR, 1991). Inhalation exposure to 27 ppm resulted in drowsiness and irritation to the mucous membranes. Central nervous system effects (headaches and changes in behavior/performance tests) are seen beginning at 110 to 1,000 ppm in humans and animals. Higher concentrations of 3,000 to 5,000 ppm produce anesthesia and unconsciousness in humans (ATSDR, 1991).

Subchronic inhalation exposure to 35 to 2,000 ppm did not cause observable injury to rats, mice, rabbits, guinea pigs, monkeys or dogs (ATSDR, 1991). Kidney weights were increased after exposure to 75 ppm. Inhalation exposure of mice and rats to 300 to

1,800 ppm during pregnancy resulted in no treatment-related increase in malformations (ATSDR, 1991). However, concentrations of 2,000 ppm altered sperm morphology in mice (ATSDR, 1991). Visual discrimination was impaired in rats exposed to 1,000 ppm. Hematological effects such as altered hemoglobin levels and myelotoxic anemia have been reported at higher exposures in animals. Chronic exposure to 300 ppm TCE caused nucleocytosis in the kidneys of rats (ATSDR, 1991). USEPA has not derived an inhalation RfD for TCE (USEPA, 1992), and ATSDR considers it inappropriate to derive an inhalation minimal risk level (MRL) since the LOAEL for CNS effects in humans following acute exposure to TCE is lower than the NOAELs for subchronic and chronic exposures in animals (ATSDR, 1991).

Numerous cases of human fatality from oral intake of TCE have been recorded in the literature (ATSDR, 1991). However, doses producing death in humans have not been adequately quantified. Other effects from oral exposure to TCE include enlarged kidney and impaired renal function. No dose-response data are available on the renal and hepatic effects of TCE in humans. In mice, a number of hepatic effects including increased liver weight, enlarged hepatocytes, centrilobular swelling and necrosis were noted after oral doses of 100 to 1,200 mg/kg/day. Renal effects such as nucleocytosis, cytomegaly and nephropathy were observed in rats and mice exposed to 250 to 549 mg/kg-day TCE (ATSDR, 1991). USEPA has not derived an oral RfD for TCE (USEPA, 1993), but ATSDR calculated a subchronic oral MRL of 0.1 mg/kg-day based on hepatic effects (ATSDR, 1991).

30.2 Carcinogenic Effects

Human epidemiological studies do not provide clear evidence of a causal relationship between TCE exposure and increased risk of cancer. Inhalation exposure to TCE in the workplace has been associated with increased rates of bladder cancer and lymphoma, and oral exposure has been linked to increased incidence of leukemia. However, lack of adequate exposure data, small sample sizes and concurrent exposure to other chemicals limit the findings of these reports (ATSDR, 1991).

Animal studies indicate that TCE is carcinogenic in mice and rats. Inhalation and/or oral exposure resulted in lung and liver tumors in mice and kidney and testicular tumors in rats (ATSDR, 1991). The USEPA calculated an inhalation unit risk of 1.7E-6 $(\mu g/m^3)^{-1}$, based on two inhalation studies (Maltoni et al., 1986; Fukuda et al., 1983) which found lung adenomas in mice. This corresponds to an inhalation slope factor of 6E-3 $(mg/kg/day)^{-1}$, assuming inhalation of 20 m^3/day by a 70-kg human.

Based upon the results from two comprehensive studies (NCI, 1976; NTP, 1983) finding increased incidence of hepatocellular carcinomas in male and female mice following chronic exposure (by gavage) to TCE, an oral slope factor of 1.1E-02 $(mg/kg/day)^{-1}$ was derived (USEPA, 1993). The carcinogenicity assessment for TCE has been withdrawn from IRIS, pending resolution of the cancer weight-of-evidence classification (Group B2 or C) (USEPA, 1993).

30.3 References

ATSDR. 1991. Agency for Toxic Substances and Disease Registry. Toxicological profile for trichloroethylene. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

Fukuda K, Takemoto K, Tsuruta H. 1983. Inhalation carcinogenicity of trichloroethylene in mice and rats. Ind. Health 21:243-254.

Maltoni C, Lefemine G, Cotti G. Experimental research on trichloroethylene carcinogenesis. Archiv. Res. Industrial Carcinogenesis Series. Maltoni C, Mehlmean MA, eds. Vol. V. Princeton, NJ: Princeton Scientific Publishing Co., Inc. p.393.

NCI. 1976. National Cancer Institute. Carcinogenesis bioassay of trichloroethylene. NCI Carcinogenesis Tech. Rep. Ser. No. 2, DHEW No. NIH76-802. Bethesda, MD: U.S. Department of Health, Education, and Welfare.

NTP. 1983. National Toxicology Program, Carcinogenesis bioassay of trichloroethylene. NTP Tech. Rep. Ser. No. 243, NIH83-1799. Research Triangle Park, NC: National Toxicology Program.

USEPA. 1993. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS).

USEPA. 1992. U.S. Environmental Protection Agency. Health effects assessment summary tables. Washington, DC: OERR 9200.6-303-(91-1).

31.0 URANIUM

31.1 Noncarcinogenic Effects

Studies in animals indicate that the kidney is the most sensitive target tissue of uranium-induced toxicity. Inhalation exposure to 0.05-3 mg U/m^3 for subchronic and chronic durations produced renal tubular injury in rats, guinea pigs, rabbits, and dogs (ATSDR 1989). The USEPA has not derived an inhalation RfC for uranium (USEPA 1993).

Uranium is generally considered to be much less toxic by the oral route than when exposure occurs by the inhalation route. In humans, acute intravenous doses of 0.1 mg U/kg produced signs of renal toxicity (Stokinger, 1981). In animals, oral exposure to 2.8 to 235 mg U/kg/day for subchronic and chronic durations caused kidney damage (histopathological changes and tubular atrophy) (ATSDR, 1989). Exposure to 6 mg U/kg/day during gestation caused a decreased in rat fetal body weights (ATSDR, 1989). A LOAEL of 2.8 mg U/kg/day was identified for body weight loss and moderate renal toxicity in rabbits exposed for 30 days (Maynard and Hodge, 1949). In general, the toxicity of soluble uranium compounds (uranium tetrachloride, uranyl fluoride, uranyl acetate, uranyl nitrate) is considerably greater than the less soluble compounds (uranium dioxide, uranium trioxide,

uranium tetrafluoride) (ATSDR, 1989). The USEPA derived a chronic oral RfD of 3E-3 mg U/kg/day for uranium (USEPA, 1993). The RfD was derived based on LOAEL of 2.8 mg U/kg/day for renal and body weight effects in rabbits (Maynard and Hodge, 1949). The LOAEL value was divided by an uncertainty factor of 1,000 to account for inter- and intraspecies variability, and for use of a LOAEL in place of a NOAEL. The USEPA places medium confidence in the RfD value (USEPA, 1993).

31.2 Carcinogenic Effects

Some epidemiological studies have reported increased mortality from lung cancer and lymphatic malignancies in workers exposed to uranium (ATSDR, 1989). It is difficult to determine from these studies if the increases in cancer mortality are due solely to uranium exposure, or to one of a number of confounding factors (exposure to tobacco smoke, radon and its decay products, silica and other dusts, and diesel engine exhaust fumes) (ATSDR, 1989). No evidence of a clear carcinogenic effect was observed in animal studies following oral or inhalation exposure to uranium.

Uranium is an alpha-emitting radioactive compound, and the USEPA considers all such compounds to be carcinogenic (USEPA, 1992). The slope factors for various isotopes of uranium (U_{232}-U_{238}) range from 2.6E-12 to 6.0E-8 (risk/pCi) for inhalation exposure, 8.9E-13 to 3.7E-11 (risk/pCi) for oral exposure, and 2.1E-11 to 2.4E-7 for external exposure (risk/year per pCi/g soil) (USEPA, 1992). The USEPA classifies all alpha-emitting compounds, including uranium, as Group A (human carcinogen) (USEPA, 1992).

31.3 References

ATSDR. 1989. Agency for Toxic Substances and Disease Registry. Toxicological profile for uranium (draft). Atlanta, GA: Agency for Toxic Substances and Disease Registry.

Maynard EA, Hodge HC. 1949. Studies of the toxicity of various uranium compounds when fed to experimental animals. In: The pharmacology and toxicology of uranium compounds. National Nuclear Energy Service. Division VI, Vol. I C. Voegtlin, and H.C. Hodge, Eds. McGraw Hill, New York, NY. 309-376.

Stokinger HE. 1981. The metals. In: Patty's industrial hygiene and toxicology. New York, NY: John Wiley & Sons. 1995.

USEPA. 1992. U.S. Environmental Protection Agency. Health effects assessment summary tables (HEAST). Washington, DC: U.S. Environmental Protection Agency.

USEPA. 1993. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS).

32.0 XYLENES

The term "xylenes" is used here to refer to the three possible isomers of xylene (o-, m,-, and p-) and to mixtures of these three isomers.

32.1 Noncarcinogenic Effects

Acute exposure to 299 ppm mixed xylene caused impairment in performance tests while the subjects were exercising (ATSDR, 1990). This effect was not observed in subjects at rest exposed to 299 to 396 ppm. A single exposure to 460 ppm produced eye irritation (ATSDR, 1990). Irritation of the skin and eyes are also associated with occupational exposure to xylenes. Studies in animals indicate that developmental effects may be of concern following exposure to xylenes. Exposure to 53 to 784 ppm xylenes during gestation caused a number of developmental effects including decreased pup weight, skeletal retardation, fetal anomalies, embryolethality, and resorption in rats (ATSDR, 1990). High concentrations (300 to 2,180 ppm) produced a number of neurological effects such as changes in brain neurotransmitter levels, hearing loss, changes in axon membranes, and narcosis in exposed rats (ATSDR, 1990). The USEPA has not derived a chronic inhalation RfC for xylenes (USEPA, 1993).

Large oral doses of xylenes can produce gastrointestinal irritation and coma in humans (ATSDR, 1990). Animal studies indicate that xylenes are not particularly toxic by the oral route. Acute oral LD50 values range from 3,523 to 8,600 mg/kg xylenes in rats and mice (ATSDR, 1990). An increased incidence of cleft palate was noted in mice exposed to 2,060 mg/kg/day xylenes during gestation (ATSDR, 1990). Changes in organ weights, polycythemia, and leukocytosis have been repeated in rats exposed to 150 to 1,500 mg/kg/day for subchronic durations (ATSDR, 1990). Survival was decreased in rats chronically exposed to 500 mg/kg/day, and hyperactivity was noted in mice chronically exposed to 1,000 mg/kg/day (NTP, 1986). However, most studies report little or no effect following subchronic and chronic exposures to up to 2,000 mg/kg/day. No effects were observed in male rats exposed to 250 mg/kg/day (NTP, 1986). This NOAEL value was used to derive a chronic oral RfD of 2E+0 mg/kg/day for xylenes (USEPA, 1993). The NOAEL value was adjusted for less than continuous exposure and divided by an uncertainty factor of 100 to account for inter- and intraspecies variability. The USEPA places medium confidence in the RfD value (USEPA, 1993).

32.2 Carcinogenic Effects

No studies were located regarding the potential carcinogenic effects of xylenes in humans. No evidence of carcinogenicity was observed in animals following oral and dermal exposure to xylenes (ATSDR, 1990). Due to the limited nature of the database, the USEPA has classified xylenes as Group D (not classifiable as to human carcinogenicity) (USEPA, 1993).

32.3 References

ATSDR. 1990. Agency for Toxic Substances and Disease Registry. Toxicological profile for total xylenes. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

NTP. 1986. National Toxicology Program. Technical report on the toxicology and carcinogenesis studies of xylenes (mixed) in F344/N rats and B6C3F1 mice (gavage studies). U.S. Department of Health and Human Service, National Institute of Health, National Toxicology Program.

USEPA. 1993. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS).

APPENDIX S.1

EXCERPTS FROM AR 200-1 ARMY RADON-REDUCTION PROGRAM (ARRP)

S. Miscellaneous Information

m. Promptly initiate a special O&M program for those structures where asbestos has been identified.

n. Dispose of asbestos waste material only in approved disposal facilities per Federal, State, local, and host-nation requirements. (An *approved* disposal facility in most cases will be a facility meeting asbestos disposal standards and having written notification by the State that asbestos can be disposed of at the facility.) Off-post disposal is preferred.

o. Dispose of asbestos-containing excess real property per AR 405–90.

p. Use contracting for asbestos abatement in preference to in-house abatement, unless in-house performance is adequately justified and funded and personnel are adequately trained.

q. Conduct worker education/training programs for individuals identified to work with asbestos.

r. Assess the relative health risks associated with alternative control actions. Asbestos should not be removed for the sole purpose of eliminating asbestos.

10–3. Installation asbestos management plan

As a minimum, an installation asbestos management plan will include—

a. A complete review of O&M schedules, design plans, and specifications to identify structures that are scheduled for repair, alteration, or demolition.

b. An installation-wide survey of all structures to determine the location, extent, and condition of all asbestos.

(1) First priority for installation surveys will be to identify the existence of asbestos in aging or deteriorated condition that presents a significant exposure potential in structures occupied or likely to be occupied; in structures to be repaired, altered, or demolished; in DA-controlled schools and child development centers; in hospitals; and in residential housing. These determinations of exposure potential do not have to be supported by independent air sampling for asbestos.

(2) All installation-wide surveys will be completed within 1 year from the effective date of this regulation.

(3) All asbestos survey work will be conducted by accredited personnel meeting the *inspector* training requirements of AHERA and other applicable Federal, State, local, and host-nation requirements. These personnel will be supervised by a similarly qualified industrial hygienist, or other qualified health and safety or environmental professional, who meets the OSHA definition of *competent person*, as specified in 29 CFR 1926.58(b).

(4) Annual follow-up inspections will be performed by accredited personnel to identify and report damage and deterioration of asbestos.

c. Documentation of the presence, extent, and condition of asbestos, using the survey and assessment criteria described in TM 5-612.

d. Assessment, for each occurrence of asbestos, of the potential for environmental release and of the associated risk to human health and the environment.

(1) All assessments will be conducted by accredited personnel meeting the *management planner* training requirements of AHERA and other applicable Federal, State, local, and host-nation requirements.

(2) In OCONUS locations where AHERA-accredited personnel are not available, a waiver from AHERA accreditation may be granted by commanders of MACOMs to personnel demonstrating equivalent qualifications.

e. Preparation, coordination, and scheduled implementation of an abatement plan that minimizes the potential for asbestos exposure for each assessed area where potential for asbestos exposure exists. Abatement plans will include provisions for appropriate training of workers, and a discussion of the considered abatement alternatives and the reason the preferred alternative was selected. All abatement plans will be prepared by accredited personnel meeting the AHERA *management planner* and other training requirements specified in *d*(1) and (2) above.

f. Preparation, coordination, and execution, for each occurrence of asbestos, of a special O&M plan designed to monitor the condition of asbestos and minimize environmental release and human exposure. O&M plans will include provisions for appropriate training of workers. All special O&M plans will be prepared by personnel meeting the AHERA *management planner* and other training requirements specified in *d*(1) and (2) above.

g. Provision for worker education/training programs for individuals identified to work with asbestos. Individuals will be trained and certified per Federal, State, local, and host-nation requirements, where applicable.

h. An environmental impact analysis of the installation asbestos management plan, as required by AR 200–2.

10–4. Procedures

a. Asbestos is regulated as a hazardous air pollutant under the CAA (40 CFR 61, subpart M). In addition, OSHA, State, local, and host-nation requirements that are applicable to asbestos will be considered when establishing asbestos management plans.

b. Operation of solid and hazardous waste management systems will be conducted per chapter 6.

c. To avoid duplication to the extent practical, asbestos management plans may be incorporated into existing environmental management documents such as the installation hazardous waste management plan discussed in chapter 6. Modification of an existing program is authorized only when doing so will not jeopardize the accomplishment of that program's objectives or the objectives of the Army's asbestos management program.

d. Installation asbestos management plans and asbestos-related actions that entail a potential for generating fugitive asbestos emissions will be environmentally assessed, as required by AR 200–2. Even if there is a FNSI, such a finding must be published throughout the affected geographic area.

e. Programming requests for asbestos-related actions will be clearly identified as such.

f. Specifications for the procurement of materiel will preclude the use of asbestos unless asbestos-free substitute materials do not exist.

g. Design and specifications for new construction will preclude the use of asbestos unless asbestos-free substitute materials do not exist.

h. Contracts for projects involving the removal and disposal of asbestos will use the provisions of Technical Guide Specification CEGS–02080 through 02083.

i. To ensure compliance with subpart M of the CAA, ICs will adopt the procedures outlined in paragraph 12–7*a* for noncompliance notification procedures.

10–5. Technical assistance

Technical assistance relating to health and environmental aspects of asbestos management can be obtained from the Commander, USAEHA, Aberdeen Proving Ground, MD 21010–5422. Technical assistance relating to O&M can be obtained from the Commander, USAEHSC (CEHSC–FB–S), Ft. Belvoir, VA 22060–5516.

Chapter 11
Army Radon-Reduction Program (ARRP)

11–1. Scope

a. This chapter describes policy and procedures for assessing indoor levels of radon and mitigating radon in structures where the levels are elevated. This chapter will provide a summary of the health risks associated with indoor radon, discuss DA indoor radon standards, and outline the DA radon measurement strategy.

b. The objective of the ARRP are to—

(1) Identify structures owned and leased by the Army (CONUS and OCONUS) that have indoor radon levels greater than 4 picocuries per liter (pCi/l) of air.

(2) Modify all Army-owned structures having radon levels greater than 4 pCi/l so that the levels are reduced to 4 pCi/l or less.

(3) Provide detailed guidance concerning radon measurement procedures and risk estimates which have been published in the 1989 USAEHA Technical Guide No. 164.

(4) Issue mitigation strategies and procedures which will be addressed in separate publications furnished by USACE.

11–2. ARRP requirements

a. Overview. DA has adopted a decentralized radon reduction program to identify and to mitigate indoor radon in DA structures.

(1) The installation is responsible for funding, executing, documenting, and managing the radon monitoring and mitigation efforts on that installation based upon the ARRP.

(2) The installation will purchase radon detectors and laboratory analytical services through contracts which are centrally managed by the USAEHSC. This will negate the need for the installation to develop separate, more costly contracts and will aid in ensuring the technical validity of the measurements. The installation will be responsible for proper deployment of the detectors.

(3) All radon measurements will be completed by the 4th quarter of FY91.

b. Requirements.

(1) *Installation requirements.* The installation is responsible for the management and the conduct of the radon measurements for that installation. Specifically, this requires—

(a) Purchase of the radon detectors from the centrally managed contractors.

(b) Deploying and retrieving the radon detectors in accordance with quality assurance (QA) instructions received from the USAEHSC.

(c) Shipping detectors to the QA contractor for preparation of "spikes" (that is blind samples).

(d) Shipping detectors back to the contractors for analysis.

(e) Maintaining the records required to document the results of the radon measurements and providing required summaries to their respective MACOMs.

(f) Notifying occupants of the result of radon monitoring and what actions are necessary.

(g) Establishing an archival database compatible with Army systems for storing all measurement data.

(2) *Contractor requirements.* The centrally managed contractors will provide the installation with the following—

(a) Radon detectors capable of performing the long and short term measurements and pre- and post-mitigation measurements required, with instructions for deployment, emplacement, and retrieval of the detectors.

(b) Data forms required to properly document the measurement and ensure that the detectors are properly handled.

(c) A report that will give the results of the measurement and required QA data to ensure that the measurements are valid and verifiable.

11–3. Indoor radon health risk

A radiation-induced increased risk of contracting lung cancer is the primary health concern with elevated levels of indoor radon-222.

a. Radon-222. Radon-222 is a naturally occurring, inert, radioactive gas that is formed from the radioactive decay of uranium.

(1) Uranium in the soil is the primary source of indoor radon. Elevated radon levels can be found in soils with high concentrations of uranium or those that have been contaminated with the by-products of uranium or phosphate mining.

(2) Soil composition alone is not a good indicator of a potential indoor radon problem. Increased indoor radon levels have been found in areas where uranium concentrations are relatively low.

(3) Radon levels vary considerably in the same geographic area. Adjacent structures can have radon levels that differ by a factor of 0 to 100. This can be caused by differences in construction, insulation, or differences in the soil composition or geology over which the structure was built.

(4) EPA estimates that we may expect 20 percent of our structures to exceed 4 pCi/l.

b. Source of the problem. Indoor radon concentrations have become a health concern largely due to efforts to increase the energy efficiency of our buildings.

(1) Radon-222 has always been a component of indoor air. Recent efforts to increase the energy efficiency of DA structures have resulted in a reduction in the ventilation rates and a corresponding increase in the radon concentration.

(2) The increased radon concentrations have increased the radiation dose to the lung with a corresponding increase in the risk of lung cancer to the occupants.

c. Source of the health hazard. The health hazard is caused not by the radon-222 but by the daughter products formed by the decay of radon-222.

(1) Radon-222 is an inert gas, and the majority of the radon that is inhaled is also exhaled. Because of this rapid exchange, radon-222 itself does not deliver a significant fraction of the dose to the lung.

(2) The radiation received by the lung is from the decay of the radon-222 daughter products. Radon-222 has a half-life of 3.8 days and decays into radioactive daughter products which can attach themselves to dust particles in the air. When these dust particles are inhaled, they are trapped in the lungs and begin to irradiate lung tissue.

(3) The increased risk of lung cancer is caused by the radiation dose delivered by the radon-222 daughter products trapped in the lung and is proportional to the radon concentration and the length of exposure.

d. Indoor radon standards. DA has adopted EPA's recommended remedial action level as its indoor radon standard.

(1) Remedial action will be taken if the annual average radon concentration in a structure exceeds 4 pCi/l of air.

(2) The time frame in which mitigation must be accomplished is dependent upon the measured radon concentration and is presented in table 11–1.

(3) EPA estimates that lung cancer death due to radon exposure could occur in 1 to 5 percent of a population exposed to an annual average radon concentration of 4 pCi/l for 70 years.

(4) Research is continuing to refine this risk estimate.

Table 11–1
Mitigation time frames

Radon concentration (pCi/l)	Mitigation required within
Greater than 200 [1]	1 month or move the occupants
200–20 [1]	6 months
20–8 [2]	1–4 years [3]
8–4 [2]	5 years
4 or less [1]	No action required

[1] Determined by 90-day screen or a 1-year measurement in the case of Priority 2 and 3 structures.

[2] Annual average determined by 1-year measurement. Screening measurements in this range will not be used as the basis for initiating mitigation actions.

[3] Depending on the level of the measurement.

11–4. Measurement plan

a. Objective. The objective of the assessment phase of the ARRP is to identify all Army structures that have radon levels above EPA's recommended action level of 4 pCi/l with emphasis on finding and mitigating, early in the program, those priority 1 structures (that is, residences, child care centers, schools, and hospitals) with levels greater than 20 pCi/l.

b. Priorities. Installation structures have been prioritized to ensure the objective can be cost-effectively obtained and to provide a guide for optimizing mitigation efforts. Priorities for radon assessment are—

(1) Priority 1: Day care centers, hospitals, schools, and living areas (that is, quarters, unaccompanied personnel housing, and billets).

(2) Priority 2: Areas having 24-hour operations, such as operations centers and training and RDTE facilities.

(3) Priority 3: All other routinely occupied structures.

c Planning guidance. The following additional information is provided to assist in the planning process.

(1) A coordinated effort will be made with participation by the DEH. PAO. safety office, radiation protection officer, installation DHS, family housing office, and ICs.

(2) Each alpha-track detector will cost about $12. and each charcoal canister about $7 (analysis is included in these price estimates).

(3) Each family housing unit will require one detector in its LLA for screening phase measurements. Using national average data, 20 percent of the measured structures can be expected to fall within the 4 to 20 pCi/l range and require two detectors for LTM.

(4) Hospitals, day care facilities, and schools will require one detector per 2,000 square feet on each level tested for both the screening and LTM.

(5) Priority 2 and 3 structures will also require one detector per 2,000 square feet on each level tested for the screening and LTM measurements.

(6) Further refinement of these estimates will be provided as the data become available.

d. Database management.

(1) Installations will maintain or have access to a database that will permanently capture all the information derived from the assessment and mitigation of radon.

(2) At the end of each FY, each installation will submit an annual report to its respective MACOM on its progress in implementing the ARRP. For ARNG, each State will submit an annual progress report to NGB.

11-7. Technical assistance

Technical assistance relating to the measurement of radon in buildings can be obtained from Commander, USAEHA, Aberdeen Proving Ground, MD 21010-5422, or from Commander, USAEHSC, ATTN: CEHSC-FU-S, Fort Belvoir, VA 22060-5516. Technical assistance relating to mitigation of elevated levels of radon in buildings can be obtained from USAEHSC ATTN: CEHSC-FB-S, Fort Belvoir, VA 22060-5516.

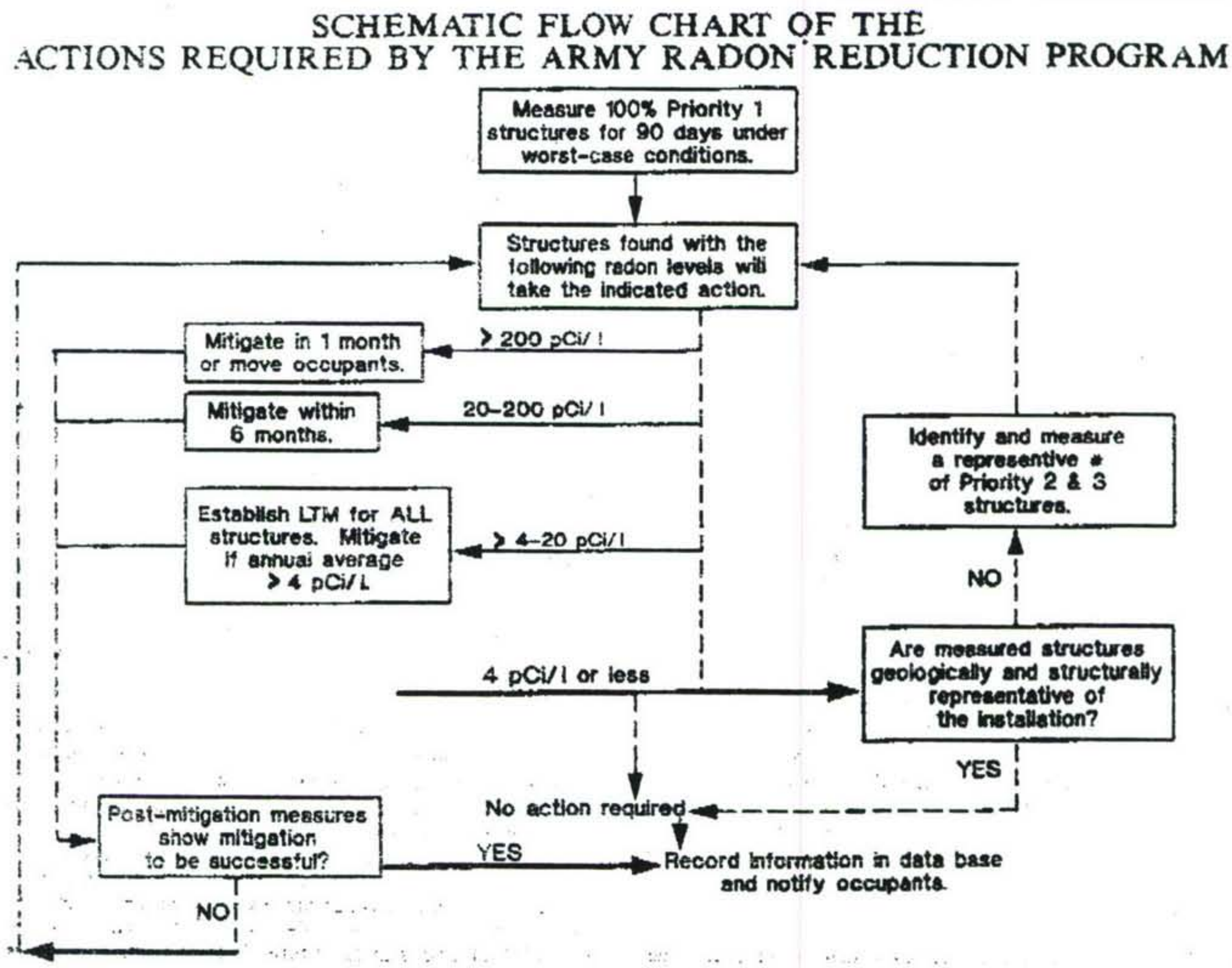

Figure 11-1. Army radon reduction program actions flow chart

Chapter 12
Other Environmental Programs

12-1. Scope

This chapter describes additional environmental programs that should be considered concurrently with the other chapters of this regulation. Each paragraph, 12-2 through 12-14, describes a different program and lists the applicable responsibilities, policies, and procedures associated with the program.

12-2. On-the-ground work

The selection of a method to effect on-the-ground work intended to carry out the requirements of this regulation will be contingent

APPENDIX S.2

ASBESTOS INVENTORY

EXECUTIVE SUMMARY TABLE

BUILDING 36

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Boiler Sheet			
FUNCTIONAL SPACE	Abandoned HVAC		
ASBESTOS TYPE/ %	Chrysotile/ 40		
SAMPLES TAKEN	25, 26, 27		
QUANTITY OF ACM	330 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	21 18 A ✓		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Tank Jacket			
FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 17		
SAMPLES TAKEN	37, 38, 39		
QUANTITY OF ACM	90 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 14 C		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mudded Fittings			
FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 40		
SAMPLES TAKEN	52, 53, 54		
QUANTITY OF ACM	14 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	15 13 C		

EXECUTIVE SUMMARY TABLE

BUILDING 36

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Air Cell Insulation

FUNCTIONAL SPACE	Abandoned HVAC		
ASBESTOS TYPE/ %	Chrysotile/ 45		
SAMPLES TAKEN	40, 41,42		
QUANTITY OF ACM	30 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	19 17 A		

HOMOGENEOUS MATERIAL - Thermal Systems INS. - Magnesia Block

FUNCTIONAL SPACE	Basement	No. Side Attic	
ASBESTOS TYPE/ %	Amosite/ 40 Chrysotile/ 1	Chrysotile/ 50	
SAMPLES TAKEN	46, 47, 48	132	
QUANTITY OF ACM	90 LF	100 LF	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 11 C	14 11 C	

HOMOGENEOUS MATERIAL - Thermal System INS. - Wrapped Cardboard

FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/30		
SAMPLES TAKEN	49, 50, 51		
QUANTITY OF ACM	161 LF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	19 12 A		

EXECUTIVE SUMMARY TABLE

BUILDING 39

Friable Materials

HOMOGENEOUS MATERIAL - Miscellaneous - Fireproofing			
FUNCTIONAL SPACE	Main Hallway 4		
ASBESTOS TYPE/ %	Chrysotile/ 15 Amosite/ 70		
SAMPLES TAKEN	79, 80, 81		
QUANTITY OF ACM	2364 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	14 17 B		

HOMOGENEOUS MATERIAL -			
FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE EXPOSURE PRIORITY			

HOMOGENEOUS MATERIAL -			
FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE EXPOSURE PRIORITY			

EXECUTIVE SUMMARY TABLE

BUILDING 43

Non-Friable Materials

HOMOGENEOUS MATERIAL - Miscellaneous - 12" x 12: Grey Floor Tile			
FUNCTIONAL SPACE	Office/ULAB		
ASBESTOS TYPE/ %	Chrysotile/ 1		
SAMPLES TAKEN	01, 02, 03		
QUANTITY OF ACM	2242 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	-- -- F		

HOMOGENEOUS MATERIAL - Miscellaneous - 1/2" Fluted Transite			
FUNCTIONAL SPACE	Roof		
ASBESTOS TYPE/ %	Chrysotile/ 5		
SAMPLES TAKEN	26		
QUANTITY OF ACM	10,400 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	-- -- F		

HOMOGENEOUS MATERIAL -			
FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE EXPOSURE PRIORITY			

EXECUTIVE SUMMARY TABLE

BUILDING 60

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Boiler Sheet			
FUNCTIONAL SPACE	Boiler Room		
ASBESTOS TYPE/ %	Chrysotile/ 5		
SAMPLES TAKEN	28, 29, 30		
QUANTITY OF ACM	450 SF	180 FT² LEFT ✓	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 24 B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Exhaust Breeching			
FUNCTIONAL SPACE	Boiler Room		
ASBESTOS TYPE/ %	Chrysotile/ 35 Amosite/ 10		
SAMPLES TAKEN	31, 32, 33		
QUANTITY OF ACM	1060 SF	120 FT² LEFT ✓	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 20 B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mudded Fittings			
FUNCTIONAL SPACE	Boiler Room		
ASBESTOS TYPE/ %	Chrysotile/ 75		
SAMPLES TAKEN	35		
QUANTITY OF ACM	4 4" Fittings ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	17 24 A ✓		

EXECUTIVE SUMMARY TABLE

BUILDING 60

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Magnesia Pipe			
FUNCTIONAL SPACE	Boiler Room	Break Room	
ASBESTOS TYPE/ %	Chrysotile/ 5 Amosite/ 35	Chrysotile/ 5 Amosite/ 35	
SAMPLES TAKEN	01, 02, 03	01, 02, 03	
QUANTITY OF ACM	1834 LF	150 LF	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	10 21 B	10 16 B	

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Troweled On			
FUNCTIONAL SPACE	Boiler Room		
ASBESTOS TYPE/ %	Chrysotile/ 4		
SAMPLES TAKEN	04, 05, 06		
QUANTITY OF ACM	58 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	8 20 B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mag Tanks			
FUNCTIONAL SPACE	Boiler Room	Boiler Room	
ASBESTOS TYPE/ %	Chrysotile/ 5 Amosite/ 30	Chrysotile/ 5 Amosite/ 30	
SAMPLES TAKEN	25, 26, 27	25, 26, 27	
QUANTITY OF ACM	530 SF	162 SF	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	13 23 B	10 20 B	

EXECUTIVE SUMMARY TABLE

BUILDING 100

Non-Friable Materials

HOMOGENEOUS MATERIAL - Miscellaneous - 9" x 9" Floortile

FUNCTIONAL SPACE	Basement	Second Balcony	
ASBESTOS TYPE/ %	Chrysotile/ 1	Chrysotile/ 2	
SAMPLES TAKEN	26, 27, 28	41	
QUANTITY OF ACM	400 SF ✓	200 SF ✓	
ASSESSMENT DAMAGE	--	--	
EXPOSURE	--	--	
PRIORITY	F	F	

HOMOGENEOUS MATERIAL - Miscellaneous - Gasket Material

FUNCTIONAL SPACE	Second Balcony		
ASBESTOS TYPE/ %	Chrysotile/ 25		
SAMPLES TAKEN	29, 30, 31		
QUANTITY OF ACM	5 SF ✓		
ASSESSMENT DAMAGE	--		
EXPOSURE	--		
PRIORITY	F		

HOMOGENEOUS MATERIAL -

FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE			
EXPOSURE			
PRIORITY			

EXECUTIVE SUMMARY TABLE

BUILDING 100

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Domestic Water

FUNCTIONAL SPACE	Basement	First Floor	Second Floor
ASBESTOS TYPE/ %	Chrysotile/ 60	Chrysotile/ 60	Chrysotile/ 60
SAMPLES TAKEN	10 thru 16	17	18
QUANTITY OF ACM	28 SF ✓	6 1/2 SF ✓	6 1/2 SF ✓
ASSESSMENT DAMAGE EXPOSURE PRIORITY	10 12 C	10 12 C	10 12 C

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Cond. Line Packing

FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 40		
SAMPLES TAKEN	23, 24, 25		
QUANTITY OF ACM	5 1/2 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	5 11 C		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. Ext. Line Packing

FUNCTIONAL SPACE	Exterior		
ASBESTOS TYPE/ %	Chrysotile/ 1		
SAMPLES TAKEN	38, 39, 40		
QUANTITY OF ACM	8 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	9 11 C		

EXECUTIVE SUMMARY TABLE

BUILDING 100

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Steam Line Fittings			
FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 50		
SAMPLES TAKEN	01, 02, 03		
QUANTITY OF ACM	22 1/2 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	6 15 C		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Reactor Pipe System			
FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 3		
SAMPLES TAKEN	04, 05, 06		
QUANTITY OF ACM	24 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	2 12 D		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Freon Circulating Lin			
FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 60		
SAMPLES TAKEN	07, 08, 09		
QUANTITY OF ACM	13 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	8 11 C		

EXECUTIVE SUMMARY TABLE

BUILDING 131

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Air Cell

FUNCTIONAL SPACE	West Stairwell	2nd Floor	
ASBESTOS TYPE/ %	Chrysotile/ 15	Chrysotile/ 15	
SAMPLES TAKEN	Similar to 104	104	
QUANTITY OF ACM	24 LF	372	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	15 14 C	3 12 D	

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Paper Wrap

FUNCTIONAL SPACE	Basement	1st Floor	Janitors Clst.
ASBESTOS TYPE/ %	Chrysotile/ 15	Chrysotile/ 15	Chrysotile/ 15
SAMPLES TAKEN	116, 117, 118	114, 115	113
QUANTITY OF ACM	570 LF	10 LF	36 LF
ASSESSMENT DAMAGE EXPOSURE PRIORITY	18 12 A	11 10 C	36 9 C

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mudded Fittings - Pap

FUNCTIONAL SPACE	Basement	1st Flr	2nd Flr
ASBESTOS TYPE/ %	Chrysotile/ 25	Chrysotile/ 25	Chrysotile/ 25
SAMPLES TAKEN	118	119	120
QUANTITY OF ACM	64 SF	3 SF	8 SF
ASSESSMENT DAMAGE EXPOSURE PRIORITY	-- -- A	-- -- C	-- -- C

EXECUTIVE SUMMARY TABLE

BUILDING 131

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Magnesia

FUNCTIONAL SPACE	Attic	First Floor	Bsmt - No. End
ASBESTOS TYPE/ %	Chrysotile/ 40	Chrysotile/ 40	Chrysotile/ 40
SAMPLES TAKEN	95	96, 97	98 to 112
QUANTITY OF ACM	60 LF	59 LF ✓	114 LF ✓
ASSESSMENT DAMAGE EXPOSURE PRIORITY	5 16 C	14 10 C	17 17 A ✓

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Magnesia

FUNCTIONAL SPACE	Basement		
ASBESTOS TYPE/ %	Chrysotile/ 40		
SAMPLES TAKEN	98 to 112		
QUANTITY OF ACM	320 LF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 15 C		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Air Cell

FUNCTIONAL SPACE	BsmtCrawlSpace	Basement	1st Flr Offce
ASBESTOS TYPE/ %	Chrysotile/ 15	Chrysotile/ 15	Chrysotile/ 15
SAMPLES TAKEN	Similar to 104	110, 111, 112	107, 108, 109
QUANTITY OF ACM	200 LF ✓	1030 LF ~~800~~ ✓	86 LF
ASSESSMENT DAMAGE EXPOSURE PRIORITY	14 17 B	13 11 C	12 11 C

EXECUTIVE SUMMARY TABLE

BUILDING 131

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Tank Jacket			
FUNCTIONAL SPACE	Boiler Room		
ASBESTOS TYPE/ %	Chrysotile/ 70		
SAMPLES TAKEN	171, 172, 173		
QUANTITY OF ACM	38 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	20 22 A ✓		

HOMOGENEOUS MATERIAL -			
FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE EXPOSURE PRIORITY			

HOMOGENEOUS MATERIAL -			
FUNCTIONAL SPACE			
ASBESTOS TYPE/ %			
SAMPLES TAKEN			
QUANTITY OF ACM			
ASSESSMENT DAMAGE EXPOSURE PRIORITY			

EXECUTIVE SUMMARY TABLE

BUILDING 229

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Magnesia Pipe

FUNCTIONAL SPACE	Pump House	Exterior	
ASBESTOS TYPE/ %	Amosite/ 20 Crocidolite/7	Similar to Sample 01	
SAMPLES TAKEN	01, 02, 03	-----	
QUANTITY OF ACM	120 LF ✓	90 LF ✓	
ASSESSMENT DAMAGE EXPOSURE PRIORITY	9 20 B	14 7 D	

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Cardboard Wrap

FUNCTIONAL SPACE	Pumphouse		
ASBESTOS TYPE/ %	Chrysotile/ 30		
SAMPLES TAKEN	04, 05, 06		
QUANTITY OF ACM	15 LF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	11 19 B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mudded Fittings

FUNCTIONAL SPACE	Pumphouse		
ASBESTOS TYPE/ %	Chrysotile/ 40		
SAMPLES TAKEN	07, 08, 09		
QUANTITY OF ACM	2 SF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	10 18 B		

EXECUTIVE SUMMARY TABLE

BUILDING 311

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Magnesium Pipe			
FUNCTIONAL SPACE	See 4A	See 4B	See 4C
ASBESTOS TYPE/ %	Amosite/ 30 Chrysotile/ 25	Amosite/ 30 Chrysotile/ 25	Amosite/ 30 Chrysotile/ 25
SAMPLES TAKEN	115, 116, 117	115, 116, 117	115, 116, 117
QUANTITY OF ACM	1216 LF ✓	148 LF ✓	93 LF ✓
ASSESSMENT DAMAGE EXPOSURE PRIORITY	7 17 B	18 17 B	9 15 B

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Air Cell			
FUNCTIONAL SPACE	High Bay Area		
ASBESTOS TYPE/ %	Chrysotile/ 30		
SAMPLES TAKEN	112, 113, 114		
QUANTITY OF ACM	1105 LF ✓		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	9 18 B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Tank Jackets			
FUNCTIONAL SPACE	Men's Locker	Room	
ASBESTOS TYPE/ %	Amosite/ 38 Chrysotile/ 45		
SAMPLES TAKEN	127, 128, 129		
QUANTITY OF ACM	60SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	8 16 C		

EXECUTIVE SUMMARY TABLE

BUILDING 311

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Skim Coat on Fiberglass

FUNCTIONAL SPACE	X Ray Facility		
ASBESTOS TYPE/ %	Chrysotile/ 62		
SAMPLES TAKEN	01, 02, 03		
QUANTITY OF ACM	562 SF ✓		
ASSESSMENT DAMAGE	16		
EXPOSURE	17		
PRIORITY	B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Canvas and Tar on Ductwork

FUNCTIONAL SPACE	X Ray Facility		
ASBESTOS TYPE/ %	Chrysotile/ 2		
SAMPLES TAKEN	04, 05, 06		
QUANTITY OF ACM	1425 sf ✓		
ASSESSMENT DAMAGE	11		
EXPOSURE	17		
PRIORITY	B		

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Mudded Fittings on Paper

FUNCTIONAL SPACE	All exHigh Bay	High Bay Areas	
ASBESTOS TYPE/ %	Chrysotile/ 40	Chrysotile/ 40	
SAMPLES TAKEN	121, 122, 123	Similar to 121	
QUANTITY OF ACM	17 SF	41 SF	
ASSESSMENT DAMAGE	7	5	
EXPOSURE	13	16	
PRIORITY	C	C	

EXECUTIVE SUMMARY TABLE

BUILDING 312

Friable Materials

HOMOGENEOUS MATERIAL - Thermal Systems Ins. - Air Cell Pipe Insulat

FUNCTIONAL SPACE	157		
ASBESTOS TYPE/ %	Chrysotile/ 35		
SAMPLES TAKEN	28, 29, 30		
QUANTITY OF ACM	9 LF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	17 17 A		

HOMOGENEOUS MATERIAL - Miscellaneous - Vibration Damper

FUNCTIONAL SPACE	3rd Flr, 136	219	
ASBESTOS TYPE/ %	Chrysotile/ 60		
SAMPLES TAKEN	46, 47, 48		
QUANTITY OF ACM	30 SF		
ASSESSMENT DAMAGE EXPOSURE PRIORITY	14 30 A		

HOMOGENEOUS MATERIAL - [illegible]

APPENDIX S.3

DOCUMENTATION OF LEAD-BASED PAINT AT MTL

SLCMT-DHS (385) 24 July 1991

MEMORANDUM FOR Major Adams, Commander

SUBJECT: Lead Dust Clean-Up in Range 313N

1. A contractor (Lead Busters) was contracted to clean the basement area, including the office, storage, and firing ranges for excessive levels of lead dust discovered during the installation of the new air system for the firing ranges.

2. The original wipe tests for lead concentration was in a range of 872 to 24,340 micrograms per square foot. These levels were too high to allow employees to work in the area doing equipment clean-up.

3. The post cleaning samples were found to be in the range of less than 20 to 1332 micrograms per square foot. This is a significant reduction in the ambient lead dust levels within the 313N basement.

4. This reduction in lead dust levels provided a more healthy and safe work environment for the employees who were assigned to work in this area. This clean-up was the combined effort of Facilities, Safety and Materials Reliability personnel and everyone should be commended for their efforts of working together for the benefit of MTL to make this place a better place to work.

5. This office looks forward to continued improved cooperation on future work projects.

Robert E. Chase
ROBERT E. CHASE
Chief, Hazards Management
& Safety Office

CF:
Dr. Bishop
Dr. Chou
Mr. Deluca
Mr. Crowell
Mr. Miliano

26 Pearl St. • Suite 110
Bellingham, MA 02019
508-966-4344

ENVIRONMENTAL SCIENCE LABORATORY, INC.

LEADBUSTERS, INC.
140 UNION STREET
LYNN MA 01901

LABORATORY REPORT
JULY 6, 1991
LEAD IN DUST - WIPE SAMPLES

PAGE 1 OF 1

ESL LOG #: 3224-3237
COLLECTED: 4-24-91
RECEIVED: 7-3-91
ANALYZED: 7-5-91

PROPERTY TESTED:
ARSENAL STREET
WATERTOWN MA

SAMPLE ID	COLLECTION SITE	AREA SAMPLED	RESULTS- MICROGRAMS/SQ FT
3224	AREA #1	6x6	276
3225	AREA #2	6x6	252
3226	AREA #3	6x6	252
3227	AREA #4	6x6	380
3228	AREA #5	6x6	128
3229	AREA #6	6x6	488
3230	AREA #7	6x6	84
3231	AREA #8	6x6	LESS THAN 20
3232	AREA #9	6x6	104
3233	AREA #10	6x6	192
3234	AREA #11	6x6	340
3235	AREA #12	6x6	232
3236	AREA #13	6x6	1332
3237	AREA #14	6x6	104

NOTE: The area sampled is assumed to be one square foot. If the actual dimensions of the area sampled were supplied, the results were adjusted to reflect a one square foot area.

INTERPRETATION OF RESULTS

NOTE: LOWEST DETECTABLE LIMIT 20 MCG/SQUARE FOOT

<<<< INDICATES RESULTS GREATER THAN ALLOWABLE THRESHOLD

**** INDICATES THAT NO THRESHOLD LEVELS ARE DEFINED FOR THE AREA TESTED, BUT RESULTS EXCEED THRESHOLD LEVELS FOR WINDOW SILLS.

ALLOWABLE THRESHOLD
FLOORS - 200 MICROGRAMS/SQ FT
WINDOW SILLS - 500 MICROGRAMS/SQ FT
WINDOW TROUGHS - 800 MICROGRAMS/SQ FT

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 4

1. CONTRACT/PURCHASE ORDER NO. DAAL04-91-M-0368

2. DELIVERY ORDER NO.

3. DATE OF ORDER 29 Mar 91

4. REQUISITION/PURCHASE REQUEST NO. DR1064-6102

5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1 DO

6. ISSUED BY: CODE: W13GW5
U.S. ARMY MATERIALS TECHNOLOGY LABORATORY
ATTN: SLCMT-PRB Sheila Winston
ARSENAL STREET, 617-923-5738
WATERTOWN, MA 02172-0001

7. ADMINISTERED BY (If other than block 6) CODE:

8. DELIVERY FOB
[X] DEST
[ ] OTHER

9. CONTRACTOR CODE:
Lead Busters Inc.
Attn: Patricia Harrin
140 Union St.
P.O. Box 2298
Lynn, MA 01903

FACILITY CODE:

10. DELIVERY TO FOB POINT BY: 10 May 1991

11. CHECK IF BUSINESS IS:
[X] SMALL
[ ] SMALL DISADVANTAGED
[ ] WOMEN OWNED

12. DISCOUNT TERMS NET 30

13. MAIL INVOICES TO: SEE BLOCK 14

14. SHIP TO: CODE: W13GW5
U.S. ARMY MATERIALS TECHNOLOGY LABORATORY
ATTN: Don Crowell SLCMT-DHS
ARSENAL STREET
WATERTOWN, MA 02172-0001 DAAL04-91-M-0368

15. PAYMENT WILL BE MADE BY: CODE:
FINANCE & ACCOUNTING OFFICER
U.S. ARMY R & D CENTER
KANSAS ST., NATICK, MA 01760
DAAL04-91-M-0368

MARK ALL PACKAGES AND PAPERS WITH PURCHASE OR CONTRACT NO.

16. TYPE OF ORDER

DELIVERY [ ] This delivery order is issued on another Government agency in accordance with and subject to terms and conditions of above contract.

PURCHASE [X] Ref your Written Quote to furnish the following on terms specified herein.

ACCEPTANCE: The contractor hereby accepts the offer represented by the numbered purchase order as it may previously have been or is now modified subject to all of the terms & conditions set forth and agrees to perform the same.

NAME OF CONTRACTOR — SIGNATURE — TYPED NAME AND TITLE — DATE SIGNED 4-2-91

[ ] IF THIS BOX IS MARKED, SUPPLIER MUST SIGN ACCEPTANCE & RETURN 1 COPY

17. ACCOUNTING AND APPROPRIATION DATA A/C: 2112040 164-8929 P612105.H84 26EB S19129 CC: 1DROOR7D500D2
STOCK FUND: NONE

18. ITEM NO	19. SCHEDULE OF SUPPLIES/SERVICES	20. QUANTITY	21. UNIT	22. UNIT PRICE	23. AMOUNT
001	Contractor shall supply all labor, materials, and equipment to furnish lead abatement services at the Army Materials Technology Laboratory, Building 313H, Firing Range. All work shall be completed in accordance with attached Statement of Work, (Attachment No. 1).	1	job	$7200.00	$7200.00

24. UNITED STATES OF AMERICA
BY THOAMS P. TULLY
CONTRACTING/ORDERING OFFICER

25. TOTAL $7200.00

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO CONTRACT EXCEPT AS NOTED

27. SHIP NO
[ ] PARTIAL
[ ] FINAL

28. D.O. VOUCHER NO

30. INITIALS

32. PAID BY

33. AMOUNT VERIFIED CORRECT FOR

DATE SIGNATURE OF AUTHORIZED GOV'T REPRESENTATIVE

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

34. CHECK NUMBER

36. I certify this account is correct and proper for payment.

35. BILL OF LADING

DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. RECEIVED AT

38. RECEIVED BY

39. DATE RECEIVED

41. S/R ACCOUNT NO

42. S/R VOUCHER NO.

DD FORM 1155

26 Pearl St. • Suite 110
Bellingham, MA 02019
508-966-4344

ENVIRONMENTAL SCIENCE LABORATORY, INC.

LEAD BUSTERS, INC.
P.O. BOX 2298
LYNN MA 01903

LABORATORY REPORT
FEBRUARY 16, 1991
LEAD IN SOIL

PAGE 1 OF 1

ESL LOG #: 2107-2129
COLLECTED:
RECEIVED: 2-8-91
ANALYZED: 2/9-13/91

PROPERTY TESTED:
ARSENAL STREET
WATERTOWN MA

ID #	DESCRIPTION	MG SOIL SAMPLED DRY WGHT	MG LEAD PER SAMPLE	PPM LEAD DRY WT
	ALL SAMPLES ARE COMPOSITES FROM SITES NOTED			
BUILDING 117:				
1A 2'	WINDOWS 1, 2 & 3	3880	4.975	1934 <<<
1A 6'	WINDOWS 1, 2 & 3	5160	5.390	2321 <<<
1A 12'	WNDW 1 & 2 (REST CONCRETE)	2400	0.638	406
1B 2'	L OF WNDWS 1 & 2 & CHIMNEY	2010	0.448	281
.B 6'	WINDOWS 1 & 2 & CHIMNEY	3160	0.758	304
.B 12'	WINDOWS 1 & 2 & CHIMNEY	5090	0.859	220
.C 2'	COLMN 1, WNDW 1 & CRNRBRD	2390	0.780	417
.C 6'	WINDOWS 1 & 3 & PORCH	6220	2.354	514
.C 12'	WINDOWS 1 & 3 & PORCH	3830	1.307	471
.D 2'	WNDW 1/2, L WNDW 1, R BLKHD	1910	0.597	394
D 6'	WNDW 1/2, L WNDW 1, R BLKHD	2380	0.280	146
.D 12'	WNDW 1/2, L WNDW 1, R BLKHD	3350	0.898	373
UILDING 118:				
A 2'	WNDW 1/2, WINDW 6, WNDW 9/10	2300	0.359	316
A 6'	WNDW 1/2, WNDOWS 4 & 8	1470	0.186	257
B 2'	R BLOCK, MID BLOCK, L BLOCK	2740	0.242	137
B 6'	WNDW 1, WNDW 1/2, WNDW 2/3	2860	0.429	350
B 12'	WNDW 1, WNDW 1/2, WNDW 2/3	3220	0.810	310
C 2'	R DRAINS 1 & 4, R DOOR 1	1320	3.134	3239 <<<
C 6'	R DRAIN 1, L DOORS 1 & 4	970	4.520	4660 <<<
C 12'	R DRAIN 1, DOORS 1 & 4	4920	2.545	662
D 2'	WNDW 1/2, WNDW 3, L BLOCK	4260	2.044	652
D 6'	WNDW 1/2, WNDW 3, L BLOCK	3080	1.097	480
D 12'	WNDW 1/2, WNDW 3, L BLOCK	5820	2.100	481

...ES OR SERVICES

PAGE 1 OF 5

...PURCHASE ORDER NO. | 2. DELIVERY ORDER NO. | 3. DATE OF ORDER | 4. REQUISITION/ PURCHASE REQUEST NO. | 5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1

...AAL04-91-M-0181 | | 1991 JANUARY 28 | HH 0351-6101 | DO

ISSUED BY: CODE: W138H5
...S. ARMY MATERIALS TECHNOLOGY LABORATORY
...TN: SLCMT-PRB Marilyn A. Keenan
...SENAL STREET, 617/923-5109
...TERTOWN, MA 02172-0001

7. ADMINISTERED BY (If other than block 6) CODE:

DUPLICATE ORIGINAL

8. DELIVERY FOB
[X] DEST
[ ] OTHER

CONTRACTOR CODE: FACILITY CODE:
Lead Busters, Inc.
ATTN: Patricia A. Marrin
140 Union St., Suite LL4
Lynn, MA 01901
Tel: 617/592-5323

10. DELIVERY TO FOB POINT BY: 5 February 1991
12. DISCOUNT TERMS Net 30 days
13. MAIL INVOICES TO: SEE BLOCK 14

11. CHECK IF BUSINESS IS:
[X] SMALL
[ ] SMALL DISADVANTAGED
[X] WOMEN OWNED

. SHIP TO: CODE: W138H5
...S. ARMY MATERIALS TECHNOLOGY LABORATORY
...TN: DONALD CROWELL/SLCMT-DHS/BLDG. 37
...SENAL STREET
...TERTOWN, MA 02172-0001 DAAL04-91-M-0181

15. PAYMENT WILL BE MADE BY: CODE:
FINANCE & ACCOUNTING OFFICER
U.S. ARMY R & D CENTER
KANSAS ST., NATICK, MA 01760
DAAL04-91-M-0181

MARK ALL PACKAGES AND PAPERS WITH PURCHASE OR CONTRACT NO.

...PE OF ...DER

DELIVERY [ ] This delivery order is issued on another Government agency in accordance with and subject to terms and conditions of above contract.

PURCHASE [X] Ref your quote date 1/25/91 to furnish the following on terms specified herein.

...CEPTANCE: The contractor hereby accepts the offer represented by the numbered purchase order as it may previously have been or is ...w modified subject to all of the terms & conditions set forth and agrees to perform the same.

NAME OF CONTRACTOR | SIGNATURE | TYPED NAME AND TITLE | DATE SIGNED

| IF THIS BOX IS MARKED, SUPPLIER MUST SIGN ACCEPTANCE & RETURN 1 COPY

. ACCOUNTING AND APPROPRIATION DATA A/C: 2117025 164 8929 P1920 2572 S19129 CC: 1FHC0H2F71304
STOCK FUND: None

. ITEM NO	19. SCHEDULE OF SUPPLIES/SERVICES	20. QUANTITY	21. UNIT	22. UNIT PRICE NOT TO EXCEED	23. AMOUNT NOT TO EXCEED
0001	Contractor shall supply all labor, equipment, materials, services, and insurance to perform a Lead Inspection in order to determine the presence and quantity of lead on all interior and exterior portions of the described buildings (Attachment No. 1 and No. 2) and surrounding soil adjacent to these buildings. Building 117 contains seven rooms on two floors and basement area. Building 118 contains three four room apartment, two five room apartments and basement area. (Continued on Page 2)	1	JOB	$1,665.00	$1,665.00

. UNITED STATES OF AMERICA
Thomas P. Tully
BY THOMAS P. TULLY CONTRACTING/ORDERING OFFICER

25. TOTAL NOT TO EXCEED $1,665.00
29. DIFFERENCES

.QUANTITY IN COLUMN 20 HAS BEEN
| INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO CONTRACT EXCEPT AS NOTED

27. SHIP NO | 28. D.O. VOUCHER NO | 30. INITIALS
[ ] PARTIAL
[ ] FINAL

32. PAID BY
33. AMOUNT VERIFIED CORRECT FOR

...E SIGNATURE OF AUTHORIZED GOV'T REPRESENTATIVE

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

. I certify this account is correct and proper for payment.

34. CHECK NUMBER
35. BILL OF LADING

...E SIGNATURE AND TITLE OF CERTIFYING OFFICER

...7. RECEIVED AT | 38. RECEIVED BY | 39. DATE RECEIVED | 41. S/R ACCOUNT NO | 42. S/R VOUCHER NO.

FORM 1155

CONTINUATION SHEET	REFERENCE NO. OF DOCUMENT BEING CONTINUED DAAL04-91-M-0181	PAGE 2 OF 5 PAGES

NAME OF OFFEROR OR CONTRACTOR

LEAD BUSTERS, INC.

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	Testing shall be accomplished by using U.S. Housing and Urban Development (HUD) testing protocol. HUD requires the us of X-ray flouorescence (XFR) to determine the presence of lead. Any lead surface with a lead content of 1.0 mg/cm or higher shall be considered as lead based material.				

NOT TO EXCEED

This is a NOT TO EXCEED order, if you can not perform in exact accordance with this order, withhold performance and notify the Contracting Officer on 617/923-5726 or the purchaseing agent listed in Block 6 immediately. Please have purchase order number ready.

CITIZEN REQUIREMENTS

All employees who will perform the requirements of this purchase order onsite at the U.S. Army Materials Technology Laboratory shall be CITIZENS OF THE UNITED STATES OF AMERICA. The Government shall have and shall exercise full and complete control over denying facility access to contractor employees who are not American citizens.

CONTRACT INSPECTOR

DONALD CROWELL/SLCMT-DHS, 617/923-5367 is designated as contract inspector to inspect and accept services rendered. Upon acceptance of work he will complete form XMR 464 and mail the original to the Procurement Division (PRB) with one copy to SLCMT-LOE. HE IS NOT authorized to direct the contractor to perform work beyond that listed in this purchase order. Vendors are cautioned not to take direction from the inspector that conflicts with the terms, conditions, or price listed herein.

Contractor shall be paid after completion of job and upon certification by the Contract Inspector, Don Crowell.

All work shall be performed Monday - Friday between the hours of 8:00 a.m. - 4:30 p.m. except Federal holidays.

INVOICING BY CONTRACTOR

Submit your invoice to the Contract Inspector designated above. Invoices shall reference the purchase order number set forth in Block 1, page 1 of the DD Form 1155. Should you have inquiries as to payment status, you should contact the Commercial Accounts Office, Finance and Accounting Office, Natick, MA, Tel No: (508) 651-4581-4582.

ATTENTION: Failure to submit your invoice directly to the Contract Inspector will result in payment delay!!!

THIS ORDER IS EXEMPT FROM MASSACHUSETTS SALES TAX. TAX EXEMPTION CERTIFICATE NUMBER IS E-042-104-496.

IF THIS IS A TIME AND MATERIALS ORDER, YOU MUST EXECUTE AND SUBMIT ATTACHED RELEASE OF CLAIMS FORM WITH YOUR INVOICE.

SMALL BUSINESS SIZE STANDARD

The Standard Industrial Classification Code applicable to this acquisition is 8999. For purposes of this procurement, the qualifying Industry Small Business Size is governed by:

[X] the average annual sales or receipts of the concern and its affiliates for the preceding three fiscal years which must not exceed $3.5.
[ ] the number of employees shall not exceed _____.

APPENDIX S.4

MTL PCB TRANSFORMER INVENTORY

WESTON MANAGERS DESIGNERS/CONSULTANTS

MTL PCB Transformer Inventory

Location	Size (KVA)	Comments	PCB Assumed Estimated	Gallons	Retrofill Date
Building 39-Roof	Switch	OK	500 ppm	35	Left intact
Building 39N-Roof	1,000	OK	500 ppm	280	1993
Building 39S-Roof	1,000	OK	5000 ppm	280	1993
Building 43-West	1,000	OK	6700 ppm	380	Left intact
Building 100-East	1,000	OK	180 ppm	380	Left intact
Building 311-West	1,000	OK	500 ppm	397	1992
Building 311-East	500	OK	500 ppm	172	1991
Building 311-East	545	OK	500 ppm	320	1993
Building 312-North	1,000	OK	500 ppm	420	Left intact
Building 312-South	47- × 1.9 gallon capacities and 3 spares	OK	500 ppm	95	Left intact

APPENDIX S.5

ANALYTICAL DETECTION LIMITS

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
00				0.000000
99				0.000000
AA9	AROMATICS/SOIL/GCPID	SO	UGG	0.260000
AA9	AROMATICS/SOIL/GCPID	SO	UGG	0.085000
AA9	AROMATICS/SOIL/GCPID	SO	UGG	0.160000
AA9	AROMATICS/SOIL/GCPID	SO	UGG	0.190000
AA9	AROMATICS/SOIL/GCPID	SO	UGG	0.390000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	5.000000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	5.690000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	11.500000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	7.460000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	1.340000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	0.550000
AAA8	ORGANOSULFURS/WATER/GCFP	WA	UGL	2.380000
AT8	ORGANOPHOSPHOR/WATER/GCFP	WA	UGL	0.392000
AT8	ORGANOPHOSPHOR/WATER/GCFP	WA	UGL	0.188000
AV8	AROMATICS/WATER/GCPID	WA	UGL	0.482000
AV8	AROMATICS/WATER/GCPID	WA	UGL	0.566000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.320000
AV8	AROMATICS/WATER/GCPID	WA	UGL	0.579000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.050000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.390000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.370000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.470000
AV8	AROMATICS/WATER/GCPID	WA	UGL	1.360000
AW8A	ORGANOPHOSPHOR/WATER/GCFP	WA	UGL	0.650000
AX8	METALS/WATER/GFAA	WA	UGL	2.350000
AY8	PESTICIDES/WATER/GCEC	WA	UGL	0.195000
AZ8	THIODIGLYCOL/WATER/HPLC	WA	UGL	6.690000
B9	METALS/SOIL/GFAA	SO	UGG	2.500000
CC8	METALS/WATER/CVAA	WA	UGL	0.100000
DD8	HYDRAZINES/WATER/SPECT	WA	UGL	2.500000
DDD9	HYDRAZINES/SOIL/SPECT	SO	UGG	50.000000
EE8	HYDRAZINES/WATER/SPECT	WA	UGL	20.000000
EEE9	HYDRAZINES/SOIL/SPECT	SO	UGG	200.000000
FF8	HYDRAZINES/WATER/SPECT	WA	UGL	25.000000
FFF9	HYDRAZINES/SOIL/SPECT	SO	UGG	200.000000
G8	ORGANONITROGEN/WATER/GCNP	WA	UGL	0.200000
G8	ORGANONITROGEN/WATER/GCNP	WA	UGL	0.140000
GG8	METALS/WATER/ICP	WA	UGL	500.000000
GG8	METALS/WATER/ICP	WA	UGL	8.400000
GG8	METALS/WATER/ICP	WA	UGL	24.000000
GG8	METALS/WATER/ICP	WA	UGL	26.000000
GG8	METALS/WATER/ICP	WA	UGL	250.000000
GG8	METALS/WATER/ICP	WA	UGL	500.000000
GG8	METALS/WATER/ICP	WA	UGL	940.000000
GG8	METALS/WATER/ICP	WA	UGL	74.000000
GG8	METALS/WATER/ICP	WA	UGL	22.000000
GG9	ORGANONITROGEN/SOIL/GCNP	SO	UGG	0.260000
GG9	ORGANONITROGEN/SOIL/GCNP	SO	UGG	0.100000
HH8	ANIONS/WATER/IONCHROM	WA	UGL	2500.000000
HH8	ANIONS/WATER/IONCHROM	WA	UGL	560.000000
HH8	ANIONS/WATER/IONCHROM	WA	UGL	5000.000000
HH8A	ANIONS/WATER/IONCHROM	WA	UGL	720.000000
HH8A	ANIONS/WATER/IONCHROM	WA	UGL	482.000000
HH8A	ANIONS/WATER/IONCHROM	WA	UGL	251.000000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	2.040000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	4.400000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	4.810000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	9.010000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	1.450000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	3.120000
HH9	ORGANOSULFURS/SOIL/GCFP	SO	UGG	1.740000
HHH9	ANIONS/SOIL/IONCHROM	SO	UGG	14.000000
HHH9	ANIONS/SOIL/IONCHROM	SO	UGG	10.000000
HHH9	ANIONS/SOIL/IONCHROM	SO	UGG	88.000000
JA02	MAGNESIUM/SOIL/AA	SO	UGG	2.370000
JD20	METALS/SOIL/GFAA	SO	UGG	0.449000
JD21	METALS/SOIL/GFAA	SO	UGG	0.467000
JD22	SILVER/SOIL/GFAA	SO	UGG	0.012400
JD23	VANADIUM/SOIL/GFAA	SO	UGG	0.941000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	14.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	24.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	7.500000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	5.600000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	21.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	9.400000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	17.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	29.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	7.200000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	19.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	7.300000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	17.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	6.400000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	14.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	21.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	4.700000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	33.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	4.400000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	8.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	3.700000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	14.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	7.900000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	6.100000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	9.200000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	19.000000
JJ8	ORGANICS/WATER/GCMS	WA	UGL	9.300000
JS08	METALS/SOIL/ICP	SO	UGG	1.550000
JS08	METALS/SOIL/ICP	SO	UGG	22.200000
JS08	METALS/SOIL/ICP	SO	UGG	6.270000
JS12	METALS/SOIL/ICP	SO	UGG	0.803000
JS12	METALS/SOIL/ICP	SO	UGG	11.200000
JS12	METALS/SOIL/ICP	SO	UGG	16.400000
JS12	METALS/SOIL/ICP	SO	UGG	6.640000
JS12	METALS/SOIL/ICP	SO	UGG	3.290000
JS12	METALS/SOIL/ICP	SO	UGG	0.427000
JS12	METALS/SOIL/ICP	SO	UGG	25.300000
JS12	METALS/SOIL/ICP	SO	UGG	1.200000
JS12	METALS/SOIL/ICP	SO	UGG	2.500000
JS12	METALS/SOIL/ICP	SO	UGG	1.040000
JS12	METALS/SOIL/ICP	SO	UGG	2.840000
JS12	METALS/SOIL/ICP	SO	UGG	6.660000
JS12	METALS/SOIL/ICP	SO	UGG	131.000000
JS12	METALS/SOIL/ICP	SO	UGG	10.100000
JS12	METALS/SOIL/ICP	SO	UGG	9.870000
JS12	METALS/SOIL/ICP	SO	UGG	14.300000
JS12	METALS/SOIL/ICP	SO	UGG	38.700000
JS12	METALS/SOIL/ICP	SO	UGG	2.740000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
JS12	METALS/SOIL/ICP	SO	UGG	7.440000
JS12	METALS/SOIL/ICP	SO	UGG	19.600000
JS12	METALS/SOIL/ICP	SO	UGG	20.700000
JS12	METALS/SOIL/ICP	SO	UGG	7.430000
JS12	METALS/SOIL/ICP	SO	UGG	14.900000
JS12	METALS/SOIL/ICP	SO	UGG	34.300000
JS12	METALS/SOIL/ICP	SO	UGG	1.410000
JS12	METALS/SOIL/ICP	SO	UGG	2.340000
JY03	HEXCHROM/SOIL/AUTOANALYZE	SO	UGG	1.000000
KF15	CYANIDE/SOIL/COLORMETRIC	SO	UGG	0.250000
KF17	NIT/SOIL/TECHNICON	SO	UGG	1.000000
KF18	INORGANIC-NONMETAL/SOIL/T	SO	UGG	41.600000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.050000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.048000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.095000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.050000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.050000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.051000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.054000
KK8	PESTICIDES/WATER/GCEC	WA	UGL	0.049000
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.001900
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.001800
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.023000
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.003300
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.005800
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.001100
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.002400
KK9A	PESTICIDES/SOIL/GCEC	SO	UGG	0.002000
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.002110
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.001370
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.023000
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.001810
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.004710
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.001880
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.004660
KK9B	PESTICIDES/SOIL/GCEC	SO	UGG	0.002770
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.053000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.071000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.260000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.085000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.170000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.077000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.084000
KKK9	PESTICIDES/SOIL/GCEC	SO	UGG	0.130000
KT07	ANIONS/SOIL/IONCHROM	SO	UGG	5.000000
KT07	ANIONS/SOI/IONCHROM	SO	UGG	7.120000
KT07	ANIONS/SOIL/IONCHROM	SO	UGG	6.360000
KT07	ANIONS/SOIL/IONCHROM	SO	UGG	5.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.400000
L9	ORGANICS/SOIL/GCMS	SO	UGG	1.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.600000
L9	ORGANICS/SOIL/GCMS	SO	UGG	2.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.900000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	1.000000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
L9	ORGANICS/SOIL/GCMS	SO	UGG	3.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	3.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	1.000000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.400000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.600000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.500000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.700000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.300000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.600000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.500000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.900000
L9	ORGANICS/SOIL/GCMS	SO	UGG	0.600000
LF05	NITROCELLULOSE/SOIL/TECH	SO	UGG	23.100000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.018700
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.010100
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.109000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.062300
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.095900
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.102000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.016700
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.015100
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.067400
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.082000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.050000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.147000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.010600
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.185000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.375000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.146000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.027100
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.083700
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.544000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.192000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.456000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.031000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.045300
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.072100
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.025000
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.012800
LG06	HALOCARBONS/SOIL/GCHALL	SO	UGG	0.043000
LH15	PESTICIDES/SOIL/GCEC	SO	UGG	0.154000
LH15	PESTICIDES/SOIL/GCEC	SO	UGG	0.080000
LH15	PESTICIDES/SOIL/GCEC	SO	UGG	0.126000
LH15	PESTICIDES/SOIL/GCEC	SO	UGG	0.159000
LH15	PESTICIDES/SOIL/GCEC	SO	UGG	0.148000
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.002800
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.001000
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.001400
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.007700
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.000700
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.068400
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.008500
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.001600
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.006500
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.002200
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.001300
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.003000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.001000
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.035900
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.100000
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.047900
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.002700
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.002700
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.003500
LH17	PESTICIDES/SOIL/GCEC	SO	UGG	0.226000
LH18	HERBICIDES/SOIL/GCEC	SO	UGG	0.035600
LH18	HERBICIDES/SOIL/GCEC	SO	UGG	0.020100
LH18	HERBICIDES/SOIL/GCEC	SO	UGG	0.030000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	1.090000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	0.798000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	2.050000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	0.518000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	0.797000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	0.263000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	1.040000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	3.510000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	53.900000
LJ05	PHENOLS/SOIL/GCPID	SO	UGG	0.202000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	5.180000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	3.200000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	13.800000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	3.330000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	0.800000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	0.802000
LL05	ORGANOSULFURS/SOIL/GCFP	SO	UGG	1.600000
LL8	ANIONS/WATER/TECHNICON	WA	UGL	10.000000
LL9	AGENTPRODS/SOIL/HPLC	SO	UGG	35.500000
LL9	AGENTPRODS/SOIL/HPLC	SO	UGG	4.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.330000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.270000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.490000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.500000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.320000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.320000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.530000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.140000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.230000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.500000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	3.300000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	2.000000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	1.800000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.640000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.230000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.310000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	2.400000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	4.400000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.260000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.960000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.240000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.250000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM23	VOLATILES/SOIL/GCMS.	SO	UGG	0.190000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	4.300000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.630000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.200000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.160000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.230000
LM23	VOLATILES/SOIL/GCMS	SO	UGG	0.780000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.220000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.042000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.520000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.050000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.042000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.034000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.620000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.490000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.520000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.061000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.065000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	3.000000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	4.700000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.400000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.570000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.320000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.055000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.350000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.240000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.057000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.150000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.098000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.100000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.600000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.600000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	3.000000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.340000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.800000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.041000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.930000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.170000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.240000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	3.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.400000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.041000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.033000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.710000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.065000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.190000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.440000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.360000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.480000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.041000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.200000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.310000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.800000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	2.400000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.180000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.130000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.080000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.520000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.800000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.680000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.097000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.320000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.066000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.310000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.071000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.210000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.038000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.570000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.068000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.240000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.060000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.065000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.079000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.063000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.230000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.065000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.800000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.200000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.065000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.970000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.240000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.480000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	2.400000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.480000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.390000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.260000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.140000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.180000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.740000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.800000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.220000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.460000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.100000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.290000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.075000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.320000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.790000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	6.300000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.760000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.032000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.069000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.052000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.064000

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.068000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.100000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	1.700000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.083000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.920000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	0.130000
LM25	SEMIVOLATILES/SOIL/GCMS	SO	UGG	12.000000
LN08	NITROSAMINES/SOIL/NPD	SO	UGG	0.006000
LN08	NITROSAMINES/SOIL/NPD	SO	UGG	0.055000
LN08	NITROSAMINES/SOIL/NPD	SO	UGG	0.080000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	0.922000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	0.504000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	2.000000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	2.500000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	2.000000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	2.000000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	1.140000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	1.280000
LW23	EXPLOSIVES/SOIL/HPLC	SO	UGG	2.110000
LW27	NG AND PETN/SOIL/HPLC	SO	UGG	0.510000
LW27	NG AND PETN/SOIL/HPLC	SO	UGG	1.000000
LW28	TETRAZENE/SOIL/HPLC	SO	UGG	1.840000
LW30	NITROGUANIDINE/SOIL/HPLC	SO	UGG	0.044700
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.760000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.780000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	1.700000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.730000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.760000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	1.100000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	1.010000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.990000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	7.400000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.500000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.820000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.750000
N8	HALOCARBONS/WATER/GCCON	WA	UGL	0.560000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.430000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.390000
N9	VOLATILES/SOIL/GCMS	SO	UGG	1.700000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.280000
N9	VOLATILES/SOIL/GCMS	SO	UGG	1.700000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.560000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.740000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.360000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.250000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.250000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.380000
N9	VOLATILES/SOIL/GCMS	SO	UGG	1.500000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.290000
N9	VOLATILES/SOIL/GCMS	SO	UGG	1.500000
N9	VOLATILES/SOIL/GCMS	SO	UGG	2.400000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.640000
N9	VOLATILES/SOIL/GCMS	SO	UGG	20.000000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.250000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.380000
N9	VOLATILES/SOIL/GCMS	SO	UGG	2.100000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.250000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.730000
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.250000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
N9	VOLATILES/SOIL/GCMS	SO	UGG	0.540000
N9	VOLATILES/SOIL/GCMS	SO	UGG	4.900000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.088000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.260000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.240000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.074000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.260000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.085000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.120000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	3.700000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.068000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.200000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.270000
NN9	HALOCARBONS/SOIL/GCCON	SO	UGG	0.140000
P8	VOLATILES/WATER/GCFID	WA	UGL	5.900000
P8	VOLATILES/WATER/GCFID	WA	UGL	5.000000
P8	VOLATILES/WATER/GCFID	WA	UGL	4.900000
P9	METALS/SOIL/ICP	SO	UGG	0.740000
P9	METALS/SOIL/ICP	SO	UGG	6.500000
P9	METALS/SOIL/ICP	SO	UGG	4.700000
P9	METALS/SOIL/ICP	SO	UGG	8.400000
P9	METALS/SOIL/ICP	SO	UGG	8.700000
PP9	VOLATILES/SOIL/GCFID	SO	UGG	1.100000
PP9	VOLATILES/SOIL/GCFID	SO	UGG	0.450000
PP9	VOLATILES/SOIL/GCFID	SO	UGG	0.640000
S9	PESTICIDES/SOIL/GCEC	SO	UGG	0.005000
SC07	METALS/WATER/FLAME AA	WA	UGL	8.350000
SD18	METALS/WATER/GFAA	WA	UGL	4.470000
SD25	METALS/WATER/GFAA	WA	UGL	2.530000
SD26	METALS/WATER/GFAA	WA	UGL	0.333000
SD29	METALS/WATER/GFAA	WA	UGL	4.380000
SF01	CRHEX/WATER/TECH	WA	UGL	2.500000
SS12	METALS/WATER/ICP	WA	UGL	10.000000
SS12	METALS/WATER/ICP	WA	UGL	112.000000
SS12	METALS/WATER/ICP	WA	UGL	117.000000
SS12	METALS/WATER/ICP	WA	UGL	230.000000
SS12	METALS/WATER/ICP	WA	UGL	2.820000
SS12	METALS/WATER/ICP	WA	UGL	1.120000
SS12	METALS/WATER/ICP	WA	UGL	105.000000
SS12	METALS/WATER/ICP	WA	UGL	6.780000
SS12	METALS/WATER/ICP	WA	UGL	25.000000
SS12	METALS/WATER/ICP	WA	UGL	16.800000
SS12	METALS/WATER/ICP	WA	UGL	18.800000
SS12	METALS/WATER/ICP	WA	UGL	77.500000
SS12	METALS/WATER/ICP	WA	UGL	1240.000000
SS12	METALS/WATER/ICP	WA	UGL	135.000000
SS12	METALS/WATER/ICP	WA	UGL	9.670000
SS12	METALS/WATER/ICP	WA	UGL	52.700000
SS12	METALS/WATER/ICP	WA	UGL	279.000000
SS12	METALS/WATER/ICP	WA	UGL	32.100000
SS12	METALS/WATER/ICP	WA	UGL	43.400000
SS12	METALS/WATER/ICP	WA	UGL	60.000000
SS12	METALS/WATER/ICP	WA	UGL	97.100000
SS12	METALS/WATER/ICP	WA	UGL	59.900000
SS12	METALS/WATER/ICP	WA	UGL	118.000000
SS12	METALS/WATER/ICP	WA	UGL	125.000000
SS12	METALS/WATER/ICP	WA	UGL	27.600000
SS12	METALS/WATER/ICP	WA	UGL	18.000000
SY04	INORGANIC-METALLIC/WATER/	WA	UGL	50.000000

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
TF20	CYANIDE/WATER/TECHNICON	WA	UGL	5.000000
TF28	TOTAL NITROGEN/WATER/TECH	WA	UGL	64.000000
TF29	INORGANIC/WATER/TECHNICON	WA	UGL	10.000000
TF30	AMMONIA/WATER/TECHNICON	WA	UGL	8.420000
TF31	NITRITE/WATER/TECH	WA	UGL	5.000000
TF34	CYANIDE/WATER/TECHNICON	WA	UGL	5.000000
TT09	ANIONS/WATER/IONCHROM	WA	UGL	407.000000
TT09	ANIONS/WATER/IONCHROM	WA	UGL	278.000000
TT09	ANIONS/WATER/IONCHROM	WA	UGL	153.000000
TT09	ANIONS/WATER/IONCHROM	WA	UGL	175.000000
TY15	INORGANIC-NONMETAL/WATER/	WA	UGL	11.000000
UF05	NITROCELLULOSE/WATER/TECH	WA	UGL	222.000000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.832000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.100000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.500000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.306000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.831000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.182000
UG06	ORGANIC/WATER/HALL	WA	UGL	1.070000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.100000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.882000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.194000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.578000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.965000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.618000
UG06	ORGANIC/WATER/HALL	WA	UGL	4.910000
UG06	ORGANIC/WATER/HALL	WA	UGL	2.720000
UG06	ORGANIC/WATER/HALL	WA	UGL	24.400000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.636000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.514000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.902000
UG06	ORGANIC/WATER/HALL	WA	UGL	3.710000
UG06	ORGANIC/WATER/HALL	WA	UGL	5.460000
UG06	ORGANIC/WATER/HALL	WA	UGL	1.520000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.635000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.451000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.252000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.376000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.250000
UG06	ORGANIC/WATER/HALL	WA	UGL	0.085700
UG06	ORGANIC/WATER/HALL	WA	UGL	0.315000
UH10	HERBICIDES/WATER/GCEC	WA	UGL	0.160000
UH10	HERBICIDES/WATER/GCEC	WA	UGL	0.095000
UH10	HERBICIDES/WATER/GCEC	WA	UGL	0.263000
UH11	NP-PESTICIDES/WATER/GCEC	WA	UGL	4.030000
UH11	NP-PESTICIDES/WATER/GCEC	WA	UGL	0.384000
UH11	NP-PESTICIDES/WATER/GCEC	WA	UGL	0.373000
UH11	NP-PESTICIDES/WATER/GCEC	WA	UGL	0.647000
UH11	NP-PESTICIDES/WATER/GCEC	WA	UGL	0.787000
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.007400
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.009900
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.007700
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.031200
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.003400
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.007400
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.017600
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.050400

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.006300
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.075000
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.385000
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.176000
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.008100
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.003900
UH20	PESTICIDES/WATER/GCEC	WA	UGL	0.002500
UH20	PESTICIDES/WATER/GCEC	WA	UGL	1.640000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	2.380000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	1.520000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	1.410000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	9.850000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	16.500000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	350.000000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	1.200000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	11.500000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	39.800000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	291.000000
UJ05	PHENOLS/WATER/GCFID	WA	UGL	1.260000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	5.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	4.800000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	3.500000
UM21	VOLATILES/WATER/GCMS	WA	UGL	8.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	8.400000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	12.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	8.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	9.700000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	14.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.200000
UM21	VOLATILES/WATER/GCMS	WA	UGL	11.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	2.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	10.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.400000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.500000
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
UM21	VOLATILES/WATER/GCMS	WA	UGL	1.000000
UM21	VOLATILES/WATER/GCMS	WA	UGL	2.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	1.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	13.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	14.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	1.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	1.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	20.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.600000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	4.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	176.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	6.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	47.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.600000
UM25	ORGANICS/WATER/GCMS	WA	UGL	17.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	22.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	1.300000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.600000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	21.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	15.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.900000
UM25	ORGANICS/WATER/GCMS	WA	UGL	22.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	23.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	96.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.300000
UM25	ORGANICS/WATER/GCMS	WA	UGL	23.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	13.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.100000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.900000
UM25	ORGANICS/WATER/GCMS	WA	UGL	6.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	0.680000
UM25	ORGANICS/WATER/GCMS	WA	UGL	7.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	9.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	14.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	10.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	17.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	28.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	42.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	15.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	10.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.900000
UM25	ORGANICS/WATER/GCMS	WA	UGL	4.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	7.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.800000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
UM25	ORGANICS/WATER/GCMS	WA	UGL	12.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	54.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.300000
UM25	ORGANICS/WATER/GCMS	WA	UGL	37.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	10.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	15.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.300000
UM25	ORGANICS/WATER/GCMS	WA	UGL	12.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	12.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.100000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.900000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	21.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.300000
UM25	ORGANICS/WATER/GCMS	WA	UGL	26.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	130.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	33.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	1.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	13.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	18.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	5.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	50.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	24.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	9.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	8.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	38.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	28.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	21.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	7.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.400000
UM25	ORGANICS/WATER/GCMS	WA	UGL	7.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	11.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	24.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	21.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	0.500000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	26.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	9.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	6.800000
UM25	ORGANICS/WATER/GCMS	WA	UGL	3.700000
UM25	ORGANICS/WATER/GCMS	WA	UGL	27.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	9.100000
UM25	ORGANICS/WATER/GCMS	WA	UGL	9.900000
UM25	ORGANICS/WATER/GCMS	WA	UGL	34.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	2.200000
UM25	ORGANICS/WATER/GCMS	WA	UGL	18.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	14.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	18.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	37.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	17.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	19.000000
UM25	ORGANICS/WATER/GCMS	WA	UGL	35.000000
UN01	NITROSAMINES/WATER/GCNPD	WA	UGL	0.042100
UN01	NITROSAMINES/WATER/GCNPD	WA	UGL	0.117000
UN10	NITROSAMINES/WATER/NPD	WA	UGL	0.099000
UN10	NITROSAMINES/WATER/NPD	WA	UGL	1.800000

LABORATORY ANALYTICAL METHODS AND DETECTION LIMITS

METHOD NO.	METHOD NAME	MEDIA	UNITS	LIMIT
UN10	NITROSAMINES/WATER/NPD	WA	UGL	1.930000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.210000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.458000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.426000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.397000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.600000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.533000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.682000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.416000
UW25	EXPLOSIVES/WATER/HPLC	WA	UGL	0.631000
UW27	NG AND PETN IN WATER	WA	UGL	1.490000
UW27	NG AND PETN IN WATER	WA	UGL	2.000000
UW29	NITROGUANDINE/WATER/HPLC	WA	UGL	21.100000
UW30	TETRAZENE/WATER/HPLC	WA	UGL	7.130000
Y9	METALS/SOIL/CVAA	SO	UGG	0.050000
ZZ8A	HYDRAZINES/WATER/GCNP	WA	UGL	30.600000
ZZ8A	HYDRAZINES/WATER/GCNP	WA	UGL	2970.000000
ZZ8A	HYDRAZINES/WATER/GCNP	WA	UGL	23.000000
NA	GROSS ALPHA	WA	pCi/L	3.000000
NA	GROSS ALPHA	WA	pCi/L	4.000000
NA	ISOTOPIC URANIUM	WA	pCi/L	0.100000
NA	CESIUM-137	WA	pCi/L	1.000000
NA	ISOTOPIC THORIUM	WA	pCi/L	0.100000
NA	RADIUM-226	WA	pCi/L	0.200000
NA	RADIUM-228	WA	pCi/L	1.000000
NA	GAMMA SPEC	WA	pCi/L	*
NA	GROSS ALPHA	SO	pCi/g	4.000000
NA	GROSS BETA	SO	pCi/g	10.000000
NA	ISOTOPIC URANIUM	SO	pCi/g	0.100000
NA	THROIUM-230	SO	pCi/g	0.100000
NA	CESIUM-137	SO	pCi/g	1.000000
NA	GAMMA SPEC	SO	pCi/g	*
NA	ISOTOPIC URANIUM	FILTERS	pCi/FILTER	0.100000
NA	PLUTONIUM-239 +240	FILTERS	pCi/FILTER	0.010000
NA	AMERICIUM-241	FILTERS	pCi/FILTER	0.010000
NA	CESIUM-137	FILTERS	pCi/FILTER	3.000000
NA	TRITIUM	FILTERS	pCi/FILTER	3.000000
NA	RADIUM-226	FILTERS	pCi/FILTER	0.300000
NA	CALIFORNIUM-252	FILTERS	pCi/FILTER	0.010000
NA	CARBON-14	FILTERS	pCi/FILTER	3.000000
NA	URANIUM	URINE	mg/L	0.000100
NA	TRITIUM	URINE	pCi/L	300.000000

APPENDIX S.6

INSTRUMENT CALIBRATION DATES

WESTON MANAGERS DESIGNERS CONSULTANTS

Instrument Calibration Dates

Type		Date
Pancake G-M	Ludlum Model 12	10-8-91
	Ludlum 44-9 Probe	10-8-91
	Ludlum Model 12	4-8-91
	Ludlum 44-9 Probe	7-11-91
	Ludlum Model 12	6-25-91
	Ludlum 44-9 Probe	6-28-91
	Ludlum Model 3	6-25-91
	Ludlum 44-9 Probe	6-28-91
Beta Scintillator	Ludlum 2200	10-10-91
	Ludlum 44-1 Probe	10-11-91
Alpha Scintillator	Ludlum 2000	8-23-91
	Ludlum 43-10 Probe	8-23-91
	Ludlum 2220	10-10-91
	Ludlum 43-1 Probe	10-10-91
	Ludlum Model 3	7-10-91
	Ludlum 43-S Probe	7-10-91
	Ludlum Model 3	6-20-91
	Ludlum 43-S Probe	6-21-91
	Ludlum 2200	7-11-91
	Ludlum 43-1 Probe	10-10-91
	Ludlum 2300	10-10-91
	Ludlum 44-10 Probe	10-11-91
Gamma NaI	Ludlum Model 19	7-23-91
	Ludlum Model 19	8-15-91
FIDLER	BICRON Analyst	7-14-91

APPENDIX T

RATIONALES FOR ELIMINATION OF CERTAIN EXPOSURES FROM QUANTIFICATION

T. Pathway Eliminations

This appendix provides documentation for not including certain exposure pathways in the risk assessment for the MTL. There are four exposure pathways which were not included in risk characterization because they were thought to present trivial risks when compared with other exposure pathways. These are: exposure to containers, dermal exposures to groundwater, and inhalation of chemicals volatilizing from the groundwater and migrating to indoor air, and exposures to interior building surfaces.

1.0 EXPOSURE TO CONTAINERS

The information below demonstrates the insignificance of chemical exposures to the various sumps, drains, cisterns, etc. at the MTL. While there may be a concern for a physical hazard (i.e., falling into a cistern or a dry well), there are several reasons for not considering chemical exposures of this kind:

1. The container is inaccessible to likely receptors in the course of average human activity patterns.

2. If there is some accessibility, exposure would be very intermittent and as such would contribute little to overall site risks.

3. The container does not appear to be contaminated.

The following presents the rationale for each location.

Location	Rationale
Building 36 Dry Well	Well is 10 ft deep, covered. Not likely to be visited on a regular basis.
Building 37 Catch Basin	Part of storm sewer system beneath parking lot. Not likely to be visited on a regular basis. Contents indicative of storm water runoff.
Building 39 Sump	In tunnel beneath building, not accessible. Not contaminated. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 43 Dry Well	Not accessible, not contaminated. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.

Location	Rationale
Building 43 Sump	Exposure not likely. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 43 Tank	Not accessible. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 43 Sump	Beneath a 1,000-ton press, not accessible. Contents appear to be oil. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 97 Sump	Not likely to be contacted on a regular basis. Not contaminated. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 100 Sumps	Not accessible. May no longer be present due to on-going remediation activities involving the reactor. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 242 Cistern	Has been removed since sampling. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 242 Manhole	Not contaminated except for some metals. May have been removed. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 243 Cistern	10 ft deep hole not likely to be accessible with any regularity. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 311 Sump	25 ft deep below building surface. Not accessible. Levels of contamination not high. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.

Location	Rationale
Building 311 Tank	5 ft deep hole, little detectable contamination.
Building 311 Basins	Deep dry wells outside the building, little detectable contamination. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 311 Sump	10 ft deep hole outside, little detectable contamination.
Building 311 Tanks	4 ft deep, not accessible, no remaining sediment.
Building 313 Cistern	Accessible only through an office. Scheduled for removal. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Building 313 Basin	30 ft brick lined hole in basement. Not easily accessible. No chemical contamination is anticipated because the container has been decontaminated during the radiological decommissioning.
Bunkers, Dry Well	8 ft deep, not accessible, not contaminated.

2.0 DERMAL EXPOSURES TO GROUNDWATER

At the MTL, groundwater is not used for any purpose at this time. However, there is a possibility that future activities related to reuse could result in excavation of soils to the groundwater table. Construction workers in the area might then be exposed dermally to groundwater. This pathway is thought to be trivial and the following calculations were performed to support that assumption.

1. Exposure point concentration calculation: the highest value of any chemical detected in any groundwater sample was considered as the exposure point concentration.

2. Human Intake Factor: A 70-kg construction worker was assumed to come in contact with groundwater six days, 8 hours per day, during a one-year construction period at the site. It was assumed that 25% of the worker's skin area was exposed during the exposure event.

3. Utilizing the above inputs, carcinogenic risks were calculated using the toxicity values and equations developed in the MTL risk assessment. The estimated

carcinogenic risk was 5E-07; the estimated subchronic HI was 4E-01. Since these are well below the action levels, this pathway was not further characterized.

3.0 MIGRATION OF VOLATILE ORGANIC COMPOUNDS INTO BUILDINGS

Receptors living or working near contaminated groundwater can be exposed by subsurface transport of volatile contaminants into buildings. This flow of soil gas is driven by pressure gradients that can exist for a variety of reasons, or by diffusion through cracks or openings in a building's structure.

Complex models can estimate the volatilization from a groundwater source, the contaminant migration rate through the soil, infiltration into the substructure and the resulting concentration within the home. These calculations are useful only when site specific values are available for the model inputs. As a screening tool, estimating indoor air exposures from measured soil gas is assumed to give usable estimates of indoor air exposures. At the MTL, however, there were no measures of soil gas since there was no indication of any significant source of volatiles in the soils.

It is therefore concluded that this pathway cannot be quantified with the available information. The groundwater sampling indicated the presence of several volatile organic compounds indicative of gasoline. They were present at low levels, generally less than a part per billion. The absence of any significant source of volatile chemicals in the groundwater would likely result in little risk to persons living and working in nearby buildings from these chemicals in indoor air.

4.0 EXPOSURES TO INTERIOR BUILDING SURFACES

In an attempt to develop an approach for evaluating human health risks from exposure to chemicals deposited on and resuspended from the interior walls of buildings for the Watertown MTL site, the following were reviewed:

DOE. 1992. Baseline assessment for the chemical plant area of the Weldon Spring site. Oak Ridge, TN: Oak Ridge Field Office, U.S. Department of Energy.

Fingleton DJ, MacDonell MM, Haroun LA, Ozkaynak H, Butler DA, Xue J. 19--. Assessing exposures and risks in heterogeneously contaminated areas: a simulation approach.

Gibson JAB, Wrixon AD. 1979. Methods for the calculation of derived working limits for surface contamination by low-toxicity radionuclides. Health Phys. 36:311-321.

Hawley J. 1985. Assessment of health risk from exposure to contaminated soil. Risk Analysis 5(4):289-302.

Healy JW. 1971. Surface contamination: decision levels. Los Alamos, NM: Los Alamos Scientific Laboratory. LA-4558-MS.

Kim NK, Hawley J. 1985. Re-entry guidelines Binghamton office building. Albany, NY: Bureau of Toxic Substance Assessment, Division of Environmental Health Assessment, New York State Department of Health.

PNL. 1982. Accident generated particulate materials and their characteristics - a review of background information. Richland, WA: Prepared by Pacific Northwest Laboratory for the U.S. Nuclear Regulatory Commission. NUREG CR-2651.

Sansone EB. 1987. Redispersion of indoor surface contamination and its implications. In: Mittal KL, ed. Treatise on clear surface technology. Vol. I. Plenum Publishing Corporation. pp. 261-290.

USEPA. 1985. Exposure assessment for polychlorinated biphenyls (PCBs), polychlorinated dibenzofurans (PCDFs), and polychlorinated dibenzodioxins (PCDDs) released during transformer fires. Washington, DC: U.S. Environmental Protection Agency, Environmental Exposure Division.

Surface contamination may become airborne and inhaled and may be transferred to hands and then be ingested. Based on our review of these references, it was concluded that it is inappropriate to attempt to quantify risk from exposure to chemical residues on interior building surfaces, with the information currently available.

Redispersion of indoor surface contamination in air is dependent on many factors such that quantification of risk from this source would detract from the validity of the risk assessment. Reported data for resuspension factors range over several orders of magnitude, even in an experiment with relatively constant and reproducible conditions (Sansone 1987). Sansone (1987) identified numerous factors influencing the substantial variability of resuspension factors. These include:

- The vigor and frequency of human activity
- The fraction of transferable versus total surface contamination
- The nature of the contaminant — particle size, density, other physical characteristics and whether it was applied as a solid, suspension or solution
- The characteristics of the surface material — porous or impervious

- Ventilation rate

- The size of the contaminated surface area in relation to the total volume of the area

Based on all these factors, many of which are unknown at the MTL, the "...ability to accurately predict airborne concentrations from either mechanically or wind-caused resuspension stresses is extremely poor..." (Sansone 1987).

In addition, not all the resuspended material is respirable; the respirable fraction of the resuspended material has been estimated at 6 to 20% (Sansone 1987). Sansone (1987) concluded that "...resuspension of surface contamination in a health context is usually of minor, if not negligible, importance."

Exposure to residual chemical contamination on interior walls by direct contact with bare skin is expected to be limited mainly to hand contact with the walls. Exposure by this pathway is likely to be minimal and quantification would be highly uncertain (estimates of ingestion rates from the above studies differ by more than an order of magnitude).

In summary, considering the high uncertainty associated with attempting to quantify risk from exposure by these pathways, it would be more appropriate to discuss the potential risk from inhalation or ingestion of residual indoor surface contamination qualitatively and point out the uncertainty resulting from not quantifying risk from these pathways.

U. Quality Assurance/
Quality Control Plan

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SECTION U1

INTRODUCTION

This Quality Assurance/Quality Control Plan (QA/QC) has been prepared in accordance with the THAMA January 1990 Quality Assurance Program. The intent of the program is to ensure that reliable data are generated in support of the Army Materials Technology Laboratory (MTL) Remedial Investigation (RI) project.

This document describes in detail the organization, policies, and procedures that will be implemented as part of the QA/QC program. The contractor's laboratories will implement this plan to establish, maintain, and verify the level of quality required for this project.

Due to the nature of analytical quality control, changes to procedures outlined in this document can be anticipated. However, any changes to the plan must be approved by THAMA prior to implementation.

WESTON MANAGERS DESIGNERS/CONSULTANTS

SECTION U2

PROJECT QA/QC ORGANIZATION AND RESPONSIBILITY

U2.1 PROJECT ORGANIZATION

The project organization and responsibilities of principal personnel are described in detail in the Data Management Plan included as Appendix V. Consequently, a detailed outline for the overall project will not be presented in this section.

U2.2 QA/QC ORGANIZATION

Specific responsibilities of personal involved with the analytical and field QA/QC are described below. Data management is discussed in Appendix V.

U2.2.1 PROGRAM MANAGER

The Program Manager is ultimately responsible for ensuring the quality of all aspects of the project. The Program Manager has the authority to cease any of the activities in the program when they jeopardize the quality of the effort. He/she also has the authority to commit the necessary resources to the program to ensure that all results meet the requirements of the program.

U2.2.2 TASK MANAGER

The Task Manager is responsible for ensuring that the policies and procedures outlined in the various plans associated with this project are diligently implemented on a day-to-day basis. The Task Manager has the authority to cease operations; to reject policies, procedures, recommendations, data, and conclusions when the quality of the results are questionable; and to assign the necessary time, materials, and resources to perform the tasks to ensure the timely delivery of quality results.

U2.2.3 CORPORATE QUALITY ASSURANCE OFFICER

The Corporate Quality Assurance Officer has developed most of the corporate policies dealing with QA, initiates QA audits of active projects, and directs corrective actions when QA discrepancies are found.

U2.2.4 ANALYTICAL QUALITY ASSURANCE COORDINATOR (AQAC)

The Program-based AQAC, through the individual laboratory QC coordinators (LQAC), will oversee QA activities of the specific analytical laboratories. Responsibilities at the laboratories include maintenance of the reference material repository (to include requests for reference materials from THAMA), overseeing general laboratory operations, introduction of QA samples into the sample stream, collection and analysis

of quality control results, identification of out-of-control systems, recommendations for remedial actions, publication of QC reports, review of analytical data, publication of QA/QC operating procedures, execution of QA audits, and monitoring and reviewing certification activities. The LQAC will maintain a notebook to correlate field identification numbers, internal laboratory identification numbers, and THAMA analytical lot numbers for each sample and parameter. For each analytical system used in support of THAMA programs, the AQAC will maintain copies of all certification records and continuous quality control charts for precision and accuracy. The AQAC and LQAC have the authority to stop the collection or reporting of data when systems are deemed out-of-control.

U2.2.5 LABORATORY QUALITY ASSURANCE COORDINATOR

The Analytical Laboratory Quality Assurance Coordinator (LQAC) is responsible for maintenance of the reference material repository (including requests for reference materials from THAMA), oversight of the general laboratory operations, introduction of QC samples into the sample stream, collection and analysis of quality control results, identification of out-of-control systems, recommendations for remedial actions, publication of QC reports, review of analytical data, publication of QA/QC operating procedures, execution of QA audits, and a check and review of certification activities. The LQAC will review chain-of-custody documentation to ensure that field samples are properly accounted for. The LQAC will also maintain a notebook to correlate field identification numbers, internal laboratory identification numbers, and THAMA analytical lot numbers for each sample and parameter. For each analytical system used in support of THAMA programs, the Laboratory QA Coordinator will maintain certification records and continuous quality control charts for precision and accuracy. The LQAC has the authority to stop the reporting of data when systems are deemed to be out of control. The LQAC is not subordinate to anyone with direct responsibility for the conduct of analyses.

U2.2.6 FIELD QUALITY ASSURANCE COORDINATOR (FQAC)

The Field Quality Assurance Coordinator (FQAC) will provide the necessary quality control over field operations involving sampling, drilling, and installing the wells at the MTL. The FQAC will report directly to the Laboratory Quality Assurance Coordinator on matters related to the field operations. He/she has the authority to cease field operations or procedures when the quality of subsequent results may be jeopardized.

U2.2.7 ANALYTICAL PROJECT MANAGER

The Analytical Project Manager will be responsible for implementing the THAMA QA program. This requires submitting a detailed project QC plan, submitting the required documented methods and laboratory certification data, and ensuring implementation of corrective actions for any QA/QC deficiencies. The Analytical Project Manager is also responsible for coordinating with all subcontractor laboratories, maintaining the laboratory schedules, ensuring that technical requirements are understood by the

laboratory, and ensuring that project deliverables are submitted on time and in the required format (this includes ensuring that all requested analyses are reported).

U2.2.8 ANALYTICAL LABORATORY MANAGER

The Analytical Laboratory Manager has the responsibility to see that all tasks performed in the laboratory are conducted according to the requirements of this QA/QC plan.

U2.2.9 SECTION MANAGERS

The section managers report directly to the Analytical Laboratory Manager and will be responsible for the quality of data generated in the analysis sections. They have the authority to reject data and require reanalyses when analytical systems are questionable or out of control.

U2.2.10 DATA COORDINATOR

The Data Coordinator is responsible for ensuring that the sampling, geotechnical, and analytical data collected from the various technical areas employed on the project are properly coded and entered into the data management network.

The DC has the authority to define and implement the proper procedures as well as to impose corrective actions to ensure the accuracy and timely transfer of data from the point of generation to the THAMA Installation Restoration Data Management Information System (IRDMIS).

U2.2.11 INDIVIDUAL DATA GENERATORS

The individual data generators (geologist, chemists, technicians, data technicians) are the first line of quality control. Their personal observations are paramount in early identification of potential perturbations of data. They are responsible for generating the most reliable data possible. They have the authority to repeat analyses when previous results are considered questionable.

U2.2.12 ANALYTICAL LABORATORIES

Several laboratories will be utilized to analyze the various samples collected during Phase 2. This is to assure THAMA certification for each analyte (where certification is needed) and to reduce the chance of laboratory overload due to the large number of samples to be collected.

WESTON, which, as the prime contractor, has overall responsibility for data quality, will assure this quality as outlined below:

- Implement quality assurance checks of subcontractor laboratories.

- Conduct audits of subcontractor laboratories.
- Review the analytical and QA methods of subcontractor laboratories.
- Review all data prior to submission to THAMA.
- Maintain overall project data tracking log to assure that the contractor is always aware of the status of the data.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION U3

SAMPLING PROTOCOL

U3.1 SAMPLE CONTAINERS

Sample containers will be cleaned in accordance with the procedures outlined in Appendix CA prior to their shipment to field personnel or sample containers will be provided by commercial vendors which clean containers according to EPA protocols.

All containers provided by WESTON will be obtained from I-Chem, Hayward, California, or be of equivalent quality. I-Chem is the bottle contractor to the U.S. EPA-Contract Laboratory Program. These containers are cleaned by I-Chem in accordance with U.S. EPA protocols. The containers purchased from I-Chem are I-Chem Series 200 containers. Each lot of these containers is analyzed in accordance with I-Chem quality control requirements and is not shipped by I-Chem unless the QC requirements are met.

All sample containers will be sent to field personnel without preservatives. The preservatives will be sent in a separate container to allow for the rinsing of the container with aliquots of sample.

U3.2 SAMPLE COLLECTION

All samples will be collected in accordance with the THAMA QA Plan, 1990.

Field quality assurance samples will be collected and analyzed as follows:

- One duplicate sample will be collected for every 20 media specific (air, water, soil and wipe) samples collected. Overall handling procedures are identical for both the duplicate and the corresponding sample. The duplicate will be labeled as such, with an indication of its associated sampling location.

- One field blank will be collected for each media type sampled by passing THAMA-approved water over decontaminated field equipment. Handling and analytical procedures are the same as for samples and duplicates. Field blanks will be submitted for each analyte type sampled per day.

- Trip blanks will be prepared by the laboratory performing VOC analyses, and will be supplied with each cooler of bottles shipped. Trip blanks will remain with the cooler until it is received back at the analytical laboratory.

All instruments, including pH and conductivity meters and submersible pumps, will be calibrated prior to and following sample analysis. The calibration data will be tabulated, plotted, and subjected to statistical evaluation. Daily calibration will be performed if no samples are analyzed during an interim period. Calibration procedures are detailed in the THAMA January 1990 Quality Assurance Program.

U3.3 PRESERVATIVE

To prevent/retard the degradation of analytes in samples during transportation and storage, the samples will be preserved and stored as outlined in the THAMA January 1990 Quality Assurance Program for the compounds of interest. Efforts to preserve the integrity of the samples must be initiated at the time of sampling and will continue until analyses have been completed.

U3.4 SAMPLE SHIPMENT

After collection, samples will be immediately transported from the site to the appropriate laboratory for the analytic to be reported, and to meet the specified holding times. Samples requiring shipment by common carrier will be labelled and placed in accordance with applicable IATA regulations.

U3.5 CUSTODY

When samples are collected, they will be considered to be in the custody and, therefore, control of the sampler. As samples are collected in the field, each sample will be entered on a chain-of-custody sheet.

U3.6 DOCUMENTATION

Bound notebooks will be used to record any measurements and/or observations made in the field and to record the sample time and location. Entries will be made in waterproof ink as the samples are acquired. Typical information that will be recorded is discussed in Subsection U7.2.2.

In addition to the notebook entries, each sample container will be marked with:

- Name of facility.
- Unique sequential field identification number for each sample.
- Date of sampling.
- Preservative/filtration utilized.
- Analytes of interest.

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SECTION U4

LABORATORY ANALYSIS OF SAMPLES

U4.1 SAMPLE MANAGEMENT

When samples arrive at the laboratory, the chain-of-custody sheets or equivalent accompanying the samples will be signed by the sample custodian to formally acknowledge receipt of the samples. At the time of log-in, internal laboratory identification numbers will be assigned by the computerized laboratory tracking system. The computerized system assigns sequential log-in lot numbers to each batch of samples as well as each individual sample. The following information will be entered into the laboratory tracking system:

- Client name.
- Date of collection.
- Date of receipt.
- Administrative information such as work order numbers.
- Client references (sample identifications).
- Analytes.
- Matrix.
- Client-specified due date, if applicable.

The sample custodian will add a due date based on the earliest of:

- Three weeks from date of receipt.
- Client-specified due date.
- Analyte holding time.

Receipt of samples will also be noted in a notebook as stated in Subsection U7.2.3. THAMA sample identification numbers also will be assigned to the QC samples to ensure inclusion of the correct number of QC samples in each lot for each analytical method.

Samples will be held in locked refrigerators until they are relinquished by the sample custodian to the analysts. Chain-of-custody forms will be signed to indicate the transfer of custody. On completion of analysis or when analysts have removed the aliquots for analysis, sample containers will be returned to the sample custodian.

Once samples are logged into the computerized internal tracking system, managers and analysts can access the data. The samples being held for a parameter or group of parameters will be tracked to allow for scheduling of analyses based on holding times, required turnaround times, and the laboratory backlog.

For THAMA programs, samples will be analyzed as efficiently as possible commensurate with holding times and due dates. When sufficient samples are in-house, an analytical lot will be established with the THAMA lot coding system consistent with the THAMA Installation Restoration Data Management Information System. A lot is the maximum number of samples, including QC samples, that can be manually processed through the limiting step of the method during a single time period. The LQAC will maintain the notebook to correlate internal laboratory identification numbers, field identification numbers, and THAMA analytical lot numbers.

Under the THAMA system, field samples and quality control samples within an analytical lot are assigned a six-character identification number. A different lot designation will be used for each analytical method. The first three characters (letters) represent the analytical lot; the last three characters (numbers) represent the specific sample and the order in which the sample was analyzed within the lot.

U4.2 SAMPLE HOLDING

Samples must be extracted and/or analyzed within the required holding time. Samples are normally held for 60 days after data have been reported. For THAMA programs, samples will be stored until after data are in Level 2 of the THAMA Installation Restoration Data Management Information System and THAMA's approval has been obtained to dispose of the samples.

U4.3 CALIBRATION

Calibration procedures and frequency of calibration will be followed according to THAMA January 1990 Quality Assurance Program. On the first day of analysis, using a zero-intercept linear method, the instrument will be initially calibrated with standards set at 0, 0.5, 1, 2, 5, and 10 times the concentration in the extract corresponding to the THAMA-certified detection limit in the original sample. This assumes that the THAMA-certified range for the method spans a range of 10. In any event, the initial calibration will bracket the certified range of the method by at least 10% (see THAMA January 1990 Quality Assurance Program, Subsection 8.1).

The data from initial calibration will be tabulated and plotted. The data will also be subjected to Lack of Fit and Zero Intercept analyses. Should the data fail the LOF and ZI analyses, THAMA will be contacted to determine the course of action.

After initial calibration and analysis of samples, a calibration standard at the highest concentration will be analyzed to verify that the instrument response has not changed from the previous calibration. The response must fall within two standard deviations of the mean response for the same concentration, as determined from precertification, certification, and preinitial/daily calibrations. If the calibration standard does not yield a response within these two standard deviations, the standard will be reanalyzed. If results of the second determination still do not fall within the guidelines, the analyses will be considered invalid and the samples will be reanalyzed after initial calibration.

On subsequent days, daily calibration will be performed if no other analytical activities were conducted on the instrument in the interim period. Daily calibration will consist of the analysis of the highest calibration standard prior to and after analyses of samples. Acceptability of the results of the daily calibration standard will be based on the criteria discussed above for the analysis of the standard after initial calibration. Should daily calibration fail, initial calibration procedures will be initiated.

If instrument calibration curves are found to be nonlinear, daily calibration will consist of a minimum of three calibration standards at approximately 2, 5, and 10 times the concentration corresponding to the certified reporting limit (CRL) in a sample but within the certified range of the method. At the end of the day, two additional calibration standards approximately 2 and 10 times the concentration corresponding to the CRL will be analyzed to determine instrument drift.

Calibration curves fitted by a quadratic formula will require the analysis of four calibration standards between 2 and 10 times the concentration corresponding to the CRL for daily calibration. An additional calibration standard at approximately 10 times the concentration corresponding to the CRL will be analyzed at the end of the day.

U4.4 ANALYTICAL PROCEDURES

Analytical methods will be conducted exactly as certified, documented, and approved by THAMA. Any deviations from the approved method must be approved by THAMA prior to analysis. A list of analytical procedures is provided in Table U4-1.

Extracts exceeding the calibration or certified range will be diluted into the certified range to produce a valid result. This will be noted in the laboratory report.

U4.5 REFERENCE MATERIALS

Except for inorganic reference materials, it is anticipated that all reference materials for this program will be supplied by THAMA in usable form.

Any characterization records for reference materials not supplied by THAMA will be maintained in the laboratory and will be available for review. A portion of the material will be sent to the Central QA Laboratory.

Records of all reference materials used in this program will be maintained by the LQAC.

U4.6 DATA REDUCTION, VALIDATION, AND REPORTING

Individual analysts will be responsible for data reduction for their analyses. Concentrations of contaminants in extracts will be determined from instrumental responses of the extracts applied to the instrument calibration curve. The resultant

Table U4-1

Analytical Procedures

Parameter	Matrix	Method	Base Method
TCL Volatiles	Water	USATHAMA UM14	EPA CLP SOW
	Soil	USATHAMA LM13	EPA CLP SOW
	Air	EPA T0-14[a]	EPA T0-14
TCL Semivolatiles	Water	USATHAMA UM16[b]	EPA 8270
	Soil	USATHAMA LM24	EPA CLP SOW
	Air	EPA T0-13	EPA T0-13
TAL Metals:			
ICP	Water	USATHAMA[b]	EPA 200.7/CLP
	Soil	USATHAMA[b]	EPA 200.7/CLP
GFAA	Water	USATHAMA SD24[b]	EPA 200s/CLP
	Soil	USATHAMA JD13[b]	EPA 200s/CLP
Pb	Air	40 CFR 50 Appendix J	40 CFR 50 APP.J
Mercury	Water	USATHAMA SB03[b]	EPA 245.1/245.5
	Soil	USATHAMA JB03[b]	
TCL Pesticides/PCBs	Water	USATHAMA UH16[b]	EPA 8080
	Soil	USATHAMA LH13[b]	EPA 8080
Cyanide	Water	USATHAMA TY05	EPA 9010
	Soil	USATHAMA KY05	EPA 9010
	Air	NIOSH 7904	NIOSH 7904
TOC	Soil	EPA Method 9060	EPA 9060
pH	Soil	EPA Method 9045	EPA 9045
Nitrates	Water	USATHAMA TF01	EPA 353.1
	Soil	USATHAMA KF02	EPA 353.1
Explosives	Water	USATHAMA UW01	
	Soil	USATHAMA LW02	
	Air	NIOSH 0500	
Particulates	Air	40 CFR 50 Appendix B	40 CFR 50 APP.B
Gross Alpha/Gross Beta	Water	EPA 600	EPA 600
	Soil	Laboratory-Specific	Eberline
	Wipe	Count	Count
	Air	Count	Count
Isotopic Uranium U-234, U-235, U-238	Water	EML-300 and EPA	EML-300 and EPA
	Soil	600/4-80-032	600/4-80-032
	Wipe	EML-300	EML-300
	Air	HASL-300	HASL-300
		HASL-300	HASL-300
Americium-241	Wipe	HASL-300 (alpha spectrometry)	HASL-300

Table U4-1

Analytical Procedures (Continued)

Parameter	Matrix	Method	Base Method
TCL Volatiles	Water Soil Air	USATHAMA UM14 USATHAMA LM13 EPA T0-14[a]	EPA CLP SOW EPA CLP SOW EPA T0-14
Californium-252	Wipe	HASL-300d (alpha spectrometry)[c]	HASL-300
Radon-226	Wipe	Laboratory-Specific	EPA 903.1
Cesium-137	Soil	Laboratory-Specific	
Thorium-230	Wipe Soil	EML-300 EML-300	

[a]Method to be performed by Coast-to-Coast Laboratories.
[b]THAMA-certified methods for A.D. Little, Inc.
[c]Modification of method used for Am-241.

Note: Wipe samples will be analyzed using soil methods. Air samples for metals will be analyzed using soil methods.

concentrations will remain unadjusted before being reported to THAMA because correction factors (e.g., accuracy, percent moisture, and dilution factor) are maintained separately in the IRDMIS. Aqueous samples will be reported in terms of micrograms per liter, and solid samples will be reported in terms of micrograms per gram.

Data will contain no more than three significant figures and will be rounded only after all calculations have been completed. When samples are diluted into the certified range, the reported concentration will contain one less significant figure than an undiluted sample. Values less than the certified reporting limit will be reported as "less than" the CRL.

Method blank values will not be subtracted from sample results prior to entry into the THAMA Installation Restoration Data Management Information System.

Analytical results will be submitted to the appropriate laboratory section manager or senior analytical personnel for review before transfer to THAMA. The data will be reviewed for reasonableness and validity as well as to ensure that the required quality control was included in the analyses. Reviewers' names and dates of review will be recorded on the data package checklist similar to Appendix T in the THAMA January 1990 Quality Assurance Program. The data will then be reviewed by the LQAC before transfer to THAMA to verify that systems were in control at the time of analyses. Out-of-control conditions will be reported to and resolved by the appropriate section manager or senior analytical person.

Any errors that can be corrected by the laboratory must be corrected before transmission; otherwise the data will be returned unprocessed. Data that cannot be corrected by the laboratory will be reviewed by the THAMA Chemistry Branch for acceptance into the IRDMIS. Satisfactory data will be submitted to the data technician for entry into the THAMA Installation Restoration Data Management Information System.

The analysts enter data into the laboratory information management system used for processing the transfer files. The transfer file will be reviewed by the data technician for entry and transmission accuracy using the THAMA IRDMIS local PC system. The data technician will perform group and record checks on the data before transmission to the THAMA IRDMIS. Any errors will be corrected until final review exhibits a clean transfer file.

SECTION U5

SYSTEM CONTROLS

U5.1 SAMPLE CONTROL

The control of samples is an integral part of sample management. From the time of collection until the time of disposal, a sample is routinely accounted for through logs, chain-of-custody documents, shipping documents, laboratory work sheets, and computerized sample tracking systems. In the field, samples are under the control of field personnel until shipment to the laboratory. Within the laboratory, the samples are in the physical possession of personnel or locked in a storage refrigerator from the time of receipt until the time of disposal.

U5.2 DOCUMENT CONTROL

Documents form the basis of a legal record of a sample from the time of collection until disposal. They are also considered confidential information for the client and are treated accordingly. Only authorized personnel will be allowed access to notebooks, logs, analysis records, and client files.

U5.3 QUALITY CONTROL SAMPLES

Standard Matrix Blanks contain no known additions of target analytes. One blank shall be included in each analytical lot, regardless of certification class. A single blank/spike for GC/MS procedures (Class 1A) serves as standard matrix QC blank and spike. Matrix spike and matrix spike duplicates may be required if specified in the contract task order.

Independently prepared spiked standard and natural matrix samples shall be included in each lot. A single standard matrix QC sample, a method blank/spike, shall contain all certified surrogate analytes spiked at approximately 10 times the CRL (not to exceed the upper limit of the certified range) for GC/MS procedures (Class 1A). For the method blank/spike, surrogate results represent the QC spike, while unspiked, non-surrogate results represent the method blank. Spiked natural matrix QC samples shall consist of every field sample spiked with all certified surrogate analytes at approximately 10 CRL. The spike concentration must be the same for all samples. Two reportable significant figures shall be allowed for control sample results.

For Class 1 methods, a method blank and two spiked standard matrix QC samples shall be included in each lot. All control analyses at a concentration of approximately 10 times the CRL shall be added to the spiked standard matrix QC sample. A third standard matrix spike will contain all control analytes at approximately two times the CRL. For Class 1B methods, a method blank and one spiked standard matrix QC sample shall be included in each lot. All control analytes at a concentration of

approximately 10 times the CRL shall be added to the spiked standard matrix QC sample.

Method blanks and method spikes will not be corrected for accuracy. When method blanks with results above the CRL are encountered, the significance or impact of the results on the validity of the actual samples will be evaluated on a case-by-case basis. Generally, low level positive results from method blanks would tend to have little significance if all samples yielded relatively high concentrations. On the other hand, if concentrations of samples and method blanks were comparable, little or no contamination may exist at the site.

U5.4 CONTROL CHARTS

U5.4.1 GENERAL

Control charts will be established and maintained to track the performance of each analytical method for each analyte. Data to be used in control charts will be derived from certification data and daily quality control samples. Percent recoveries will be calculated by subtracting the instrument response value of the method blank from the instrument response value of the method spike. The found concentration (corrected for the blank) of the method spike is divided by the amount of spike, and multiplied by 100. These data will not be corrected for accuracy. Control charts will be submitted to THAMA for review within 5 working days after analysis. The laboratory will pull all control charts generated for analyses performed during the previous week and submit a package of control charts.

Each control chart will contain the following information:

- Laboratory.
- Method number.
- Chart title
    - Single day X control chart, where X is the average percent recovery
    - Single day R control chart, where R is the range of the percent recoveries
    - Three-point moving average X control chart
    - Three-point moving average R control chart.
- Analyte.
- Spike concentration.
- Percent recovery (for X control charts) or Range (for R control charts).
- Lot designation and date on the X axis.
- Mean, warning limits, and control limits.

U5.4.2 X CONTROL CHARTS

Certification data will be used to initialize the X control charts using the following procedure:

a. Percent recoveries from certification days 1 and 2 will be averaged to obtain the first value.
b. Percent recoveries from certification days 3 and 4 will be averaged to obtain the second value.
c. Percent recoveries from the method spikes in the first lot will be averaged to obtain a third value.
d. The values from a, b, and c will be averaged to obtain the average recovery (X) between pairs of spikes; this will be the central line of the X control chart.
e. The range (difference) of percent recoveries for each pair (days 1 and 2, days 3 and 4, and QC spikes from the first lot) will be averaged to obtain a value for R.
f. The upper and lower warning limits will be calculated from X +/- 1.25R, respectively.
g. The upper and lower control limits will be calculated from X+/- 1.88R, respectively.

After the first control chart points, control limits will be recalculated using only in-control data points. Any points falling outside the control limits (UCL or LCL) will be dropped from the calculations (but left on the charts) and the control limits recalculated using only points between the UCL and LCL. Charts will then be updated with the newly-calculated control limits and all points plotted. Lots associated with points outside the new control limits may require resampling and/or reanalysis as determined by the THAMA Project Officer on a case-by-case basis. These limits will then be used to control analysis of the next 20 lots. The control charts themselves are now the outlier test, although individual measurements continue to be tested as outliers if they appear not to be representative of the data set. A maximum of the 40 most recent lots will be used to recalculate control limits for 60 or more lots (40-point slide).

U5.4.3 R CONTROL CHARTS

R control charts will be initiated using the same data as described for X control charts in the previous subsection.

a. R will be the base line of the control chart.
b. The upper warning limit will be 2.511R.
c. The upper control limit will be 3.267R.

U5.4.4 THREE-POINT MOVING AVERAGE X CONTROL CHART

Three-point moving average X control charts will be constructed from the first three days of certification and updated from subsequent groups of three individual determinations of recoveries. The concentration to be plotted will be the concentration closest to twice the CRL.

a. The first point to be plotted will be the average percent recovery from the first three days of certification.
b. Subsequent points to be plotted will be the average percent recovery from subsequent groups of three determinations.
c. The range for each point is the difference between the highest and lowest values in each group of three determinations; MAR will be the average of these ranges.
d. The central point (MAX) on the control chart will be the average of the plotted points.
e. The upper and lower warning limits will be MAX +/- 0.682MAR, respectively.

f. The upper and lower control limits will be MAX +/- 1.023MAR, respectively.

U5.4.5 THREE-POINT MOVING AVERAGE R CONTROL CHART

Three-point moving average R control charts will be constructed using the same data described for the MAX control charts in the previous subsection.

a. The baseline of the control chart will be the MAR, as described in Subsection C5.4.4.
b. The upper warning limit will be 2.050MAR.
c. The upper control limit will be 2.575MAR.

U5.5 OUT-OF-CONTROL CONDITIONS

If two consecutive spikes at twice the CRL are not detected, the method is considered out of control.

An out-of-control condition will not automatically require resampling or reanalysis. The data will be reviewed daily to determine if the specific analyses were under control at the time of analysis.

U5.5.1 X CONTROL CHARTS

Analysis will be considered to be out of control if:

a. A value is outside of the control limits.
b. Five successive points monotonically increase or decrease.
c. A series of 7 successive points occurs on the same side of the central line.
d. Five successive points monotonically increase or decrease.
e. A cyclical pattern is observed.
f. Two successive points occur between the upper warning and control limits or between the lower warning and control limits.

g. More than one-third of the analytes in a multi-analyte method are out of control.

U5.5.2 R CONTROL CHARTS

Analysis will be considered to be out of control if:

a. A value is above the upper control limit.
b. Five points monotonically increase or decrease.
c. A cyclical pattern is observed.
d. Two successive points between the upper warning and control limits.

SECTION U6

PREVENTIVE MAINTENANCE

The contractor's laboratory is responsible for the periodic maintenance and calibration of its major equipment to include gas chromatograph/mass spectrometers, gas chromatographs, high pressure liquid chromatographs, atomic absorption spectrophotometers, inductively coupled spectrophotometers, UV spectrophotometer, and a infrared spectrophotometer. The contractor's laboratory is also responsible for emergency response to minimize equipment downtime.

SECTION U7

RECORDKEEPING

U7.1 GENERAL

All notebooks will be bound and will contain sequentially numbered pages. Any documentation sheets that were originally loose will be permanently affixed to the notebook if they are to be included as part of the entries.

All entries will be made in ink. Personnel making entries are required to date and sign the entries on each page. Corrections will be made by drawing a single line through the incorrect entry, entering the correction, and initialling and dating the entry.

U7.2 NOTEBOOKS AND LOGS TO BE MAINTAINED

U7.2.1 FIELD NOTEBOOKS

Field notebooks will be maintained to record all geotechnical activities including well drilling, well installation, and well development.

U7.2.2 SAMPLING

Sampling notebooks will be kept in an installation-specific notebook indicating:

- Name of the installation.
- Date and time of sampling event.
- Site information to uniquely identify sampling locations.
- Unique sequential field identification number for each sample.
- Matrix being sampled.
- Method of sampling to include filtering, if applicable.
- Sampling depth.
- Number of samples taken.
- Temperature, pH, and conductivity of well water when sampling.
- Groundwater height measurements and calculations to determine standing volume in a well.

- Volume of water removed from a well during purging.

- Preservatives added to samples.

- Analytes for which samples were taken.

- Observations which may affect the validity of the results.

- Number of shipping containers and samples shipped.

- Date of shipping.

- Printed name and signature of the sampler.

U7.2.3 LOG-IN

Information to be contained in the log-in notebook will be:

- Date of receipt.
- Carrier from whom received.
- Number of shipping containers received.
- Field identification numbers.
- Condition of samples on arrival.
- Analytes requested.
- Internal laboratory identification numbers assigned.

U7.2.4 SAMPLE AND STANDARDS PREPARATION

Notebooks will be maintained that describe the preparation of samples and calibration standards. Typical information for these notebooks includes:

- Date.
- Operation (extraction, digestion, distillation, etc.).
- Weights and volumes used.
- Sources of reagents or standards.
- Sample identification.
- Solvent.
- Concentrations or reagents and standards as well as dilution schedules.
- Expiration date.
- Signature of analyst.

U7.2.5 INSTRUMENTAL ANALYSIS

Instrumental notebooks will contain information on instrument calibration and sample analyses. Each instrument will have a specific notebook assigned to it. Typical information contained in these notebooks includes:

- Date.
- Analyte(s) of concern.
- Responses and concentrations of calibration standards.
- External calibration checks.
- Sample identification.
- Signature of analyst.

U7.2.6 REFERENCE MATERIALS

A notebook documenting transactions involving reference materials will be maintained by the LQAC.

Information contained in this document will include:

- Date of transaction.

- Nature of transaction (receipt of reference material, disbursement of reference material, request for reference material).

- Sources of reference materials.

- Identification of reference materials (lot numbers, date of subsampling, etc.).

- Internal characterization records.

- Quantities available.

- Purities or concentrations.

- Signature of person conducting the transaction.

U7.2.7 INSTRUMENT MAINTENANCE

A separate notebook will be maintained to document instrument maintenance and repairs. Information contained in these notebooks will include:

- Date of activity.
- Nature of activity (repair, periodic maintenance, parts replacement, etc.).
- Malfunctions observed.
- Signature of person performing the activity.

U7.2.8 DATA MANAGEMENT SYSTEM

A notebook will be maintained to document all lot assignments, dates of control chart generation, control chart submissions, transfer file generation, and transfer file submission.

U7.2.9 AUDITS

A notebook will be maintained by the LQAC documenting all external and internal audits conducted in support of the MTL task. This notebook will contain the formal results of THAMA conducted audits (external) as well as the internal audits performed by the LQAC as part of his/her routine duties.

SECTION U8

AUDITS

U8.1 EXTERNAL

External audits may be conducted by THAMA to resolve discrepancies or weaknesses in project plans and to verify compliance with project requirements. The results of these audits will be distributed by the auditor to the THAMA Project Officer, THAMA Analytical Branch, the contractor's Project Manager, the contractor's Analytical Project Manager, and the contractor's Laboratory QA Coordinator. The LQAC will maintain the results of these audits in the project audit notebook.

U8.2 INTERNAL

As part of his/her routine duties, the LQAC will conduct internal laboratory audits. These audits will be conducted for the prime contractor laboratory as well as for the three subcontractor laboratories. These formal laboratory audits will be documented in the project audit notebook, and the notebook will be available for inspection on request.

The LQAC will review, as part of the internal audit, the procedures and documentation associated with the MTL project. The review will include an evaluation of the adherence in actual practice to the procedures outlined in project plans and documents. In particular, procedures concerned with preparation of standards, instrumental analyses, documentation, quality control samples, and data management will be inspected. Deviations from approved procedures will be noted as well as actions taken to correct the condition. Copies of the laboratory audit will be distributed by the LQAC to the contractor's Project Manager, the contractor's Analytical Project Manager, the contractor's Analytical Laboratory Manager, and THAMA. WESTON's LQAC will conduct audits of subcontractor laboratories during the project (preferably, prior to the start of the fieldwork).

A summary of internal findings will be submitted to the contractor's Project Manager for inclusion in the final task report.

SECTION U9

CORRECTIVE ACTIONS

Corrective actions are taken when policies, procedures, or documentation are not in conformance with project direction or goals. Such actions are most effective if discrepancies are recognized and resolved at the lowest level since, at these levels, the actions tend to be most immediate. The rapid resolution of problems many times prevents the occurrence of subsequent problems which may be more difficult, expensive, or time-consuming to correct.

In accordance with this philosophy, when a discrepancy in the analytical system is observed, actions will be designed to correct the problem immediately and to bring the system into conformance with project direction and goals. The corrective action will be implemented at the lowest level to ensure rapid response. Problems that cannot be resolved at one level will be brought to the attention of the next successive level for resolution.

Data resulting from the problem area will be reviewed for validity. If the data are deemed questionable, actions will be taken either to verify the results or to repeat the procedure after the problem is corrected. In no case will questionable data be used or reported.

SECTION U10

QUALITY CONTROL REPORTS

U10.1 QUALITY CONTROL SAMPLE ANALYSES

Results of quality control samples analyzed with installation samples will be submitted via the Installation Restoration Data Management Information System (IRDMIS). These submissions are anticipated to occur on a weekly basis during periods of analytical activity.

U10.2 CONTROL CHARTS AND CONTROL CHART CHECKLIST

Control charts as well as the control chart checklist (THAMA, January 1990, Quality Assurance Program, Appendix Q) will be submitted to THAMA on a weekly basis. The report will be mailed within 5 working days after completion of the week's analyses.

WESTON MANAGERS DESIGNERS/CONSULTANTS

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V. Data Management Plan

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SECTION V1

INTRODUCTION

The goal of any project or program is to arrive at reliable and defensible conclusions and recommendations based on available data. Data generated in support of a program as well as existing data form the basis of these conclusions and recommendations. Experience in conducting environmental surveys and assessments has shown that the quantity of data that is accumulated and utilized to perform the necessary evaluations of conditions at a site can be unwieldy and confusing. Efficient and comprehensive consideration of all available data requires that these data be properly organized for efficient review and manipulation. Organization of these data must be planned prior to actual collection to ensure the generation of identifiable and usable data and to provide procedures for the efficient validation and transfer of data to a system in which they can be evaluated with minimal effort.

The purpose of this Data Management Plan is to outline the organization, policies, and procedures necessary to ensure that required map file geotechnical and chemical analysis data from the Army Materials Technology Laboratory Phase 2 Remedial Investigation are accurately and efficiently transmitted from the point of generation to the Level 2 files in the THAMA Installation Restoration Data Management Information System (IRDMIS).

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SECTION V2

ORGANIZATION

The Program Manager is ultimately responsible for all activities conducted on projects under his/her control, including data management.

To assist the Program Manager in the day-to-day operations, Project Managers are appointed to assume certain responsibilities for administration, coordination, and operations associated with a project. The Task Manager reports directly to the Program Manager and takes responsibility for the routine (and nonroutine) conduct of a project. The Task Manager also acts as a focal point for coordination of the various tasks associated with a project.

The Program Data Coordinator reports directly to the Program Manager and is responsible for the planning and technical approach of the data management activities associated with the project. The Program Data Coordinator monitors, on a periodic basis, the progress of data flow to ensure that schedule, technical quality, and resource requirements are met. In addition, he is responsible for briefing technical personnel on the requirements of the project and for identifying and resolving any technical problem areas concerning data management.

The Task Data Manager interfaces with the PDC for the day-to-day monitoring of data management activities. The TDM is responsible for ensuring that the data collected from the various technical areas employed on a task are properly coded and entered into the data management system. These data will be generated from the geotechnical, sampling, and analysis functions. The TDM has the authority to enforce proper procedures as outlined in this plan and to implement corrective procedures to ensure the accurate and timely flow and transfer of data.

Data technicians will be utilized for the actual entry of data into the IRDMIS. They will be responsible for the entry of data generated in the laboratory to produce the transfer file for transmission to UNISYS at Edgewood.

The generators of data (geologists, samplers, and chemical analysts) will be responsible for accurate and complete documentation of data required under the task and for ensuring that these data are presented to the TDM in a timely manner.

SECTION V3

GEOTECHNICAL DATA

Data generated in the field will be documented in field notebooks and on standard forms (THAMA Installation Restoration Data Management Information System data formats). The field logs will contain information such as a diary of activities, sample identification with pertinent data, well survey calculations, well level measurements, and instrument calibration data. Where applicable, boring, well, and test pit logs and well point development logs will be kept and submitted to THAMA within three working days after completion of the activity.

It is expected that immediately after the sampling activity is completed the WESTON Data Technician will create, using the PC IRDMIS, the file, generally known as its map file, which will contain the descriptions of all sample locations. The map file information includes but is not limited to site ID well/borehole depth, and the coordinates of the sample location. The map file serves 2 purposes: it is used during the record and group checking process and it provides information in support of the generation of maps and other graphics on the UNISYS-based IRDMIS.

Geotechnical files from the field will include well data, stabilized groundwater data, and field drilling data. Field drilling and stabilized groundwater data will be entered prior to sampling and analysis data. Verification of data entry will be performed by comparing the computer output with the coding documents.

When the field data have been approved by the Senior Geologist, the formatted data will be submitted to the TDM. A transfer file will be created utilizing the data entry routine supplied by THAMA. When the transfer file has been completed, the data will be transmitted to a Level 1 file on the UNISYS at Edgewood.

SECTION V4

SAMPLING AND ANALYSIS DATA

Sampling data will be collected in the field and recorded in the sampling log specific to the installation. Information to be recorded includes the site type, site ID, sampling date and time, field sample number, sample program, sample depth (if applicable), and the sampling technique. A complete listing of the information to be recorded is presented in Table V4-1. The sample container will be annotated in waterproof ink with the installation name, a field sample number, sampling date, analytes, and preservatives. A chain-of-custody form will also be completed in the field. When the samples are shipped to the laboratory, a copy of the corresponding logbook pages as well as the chain-of-custody documentation will accompany the samples.

Collection of analytical data begins on arrival of the samples at the laboratory. The chain-of-custody sheets accompanying the samples from the field are signed by the laboratory sample custodian after verification that samples noted on the documentation coincide with the sample containers being delivered. Should any containers be broken or missing, the chain-of-custody sheets will be annotated to that effect and the sampling team leader will be notified immediately. Samples will be logged into a project-specific log-in notebook and into the computerized laboratory data management system by parameter code, site identification, and laboratory sample number as well as other pertinent account information. The copies of the pages from the sampling logbook accompanying the samples and a copy of the completed chain-of-custody/log-in information will be submitted to the laboratory data technician for later correlation with the analytical results.

On receipt of the sample log information the data technician will contact the Laboratory Quality Assurance Coordinator (LQAC), who will assign analytical lot numbers to the samples in accordance with THAMA procedures. The quality control samples for each analytical lot will also receive THAMA sample numbers. The first three letters of the six-character sample code will designate the analytical lot while the remaining three digits will indicate the sample number within the lot (e.g., AAB006 indicates the sixth sample in lot AAB). This activity will be followed by the entry of lot information into the applicable laboratory computer system.

When the samples are taken for analysis, the chain-of-custody sheets will be signed by the individual analysts to acknowledge receipt of the samples for processing. When analyses are complete, the analyst will reduce the data for QC samples to determine if the analyses were in control. The QC results will then be reviewed by the section manager and forwarded to the LQAC for verification.

Table V4-1

Sampling Data

- Installation
- Field sample number
- Matrix
- Sampling depth (if applicable)
- Sampling date and time
- Sampling location
- Method of sampling
- Preservatives
- Analytes
- Significant observations
- Printed name and signature of sampler
- Number of samples taken
- Temperature, pH, and conductivity of well water when sampling
- Groundwater height measurements and calculations to determine standing volume in a well
- Volume of water removed from a well during purging
- Number of shipping containers and samples shipped
- Date of shipping

If the QAC agrees that the data are in control, the analyst will be directed to proceed with data reduction for the samples. Meanwhile, the QAC will continue to process the QC results for submission of the control charts to THAMA on a weekly basis for review and approval. Individual analysts are responsible for data reduction for their analyses. Concentrations of contaminants in extracts will be determined from instrumental responses of the extracts applied to the instrument calibration curve. The resultant concentration will then be modified by applying the appropriate dilution/concentration and sample weight or volume to obtain a final reportable concentration in the original matrix. For soils, results are not corrected for moisture; however, percent moisture is reported with the result. Aqueous samples will be reported in units of micrograms per liter, and solid samples will be reported in units of micrograms per gram.

Data will contain no more than three significant figures and will be rounded only after all calculations have been completed. When samples are diluted into the certified range, the reported concentration will contain one less significant figure than an undiluted sample. Values less than the certified reporting limit (CRL) will be reported as "less than" the CRL. The CRL for a diluted sample will be multiplied by the dilution factor to more accurately reflect the observable limit. The dilution factor is reported with the data.

Method blank values will not be subtracted from sample results prior to entry into the THAMA IRDMIS. When method blanks with results above the CRL are encountered, the significance or impact of the results on the validity of the actual samples will be evaluated on a case-by-case basis. Generally, low level positive results from method blanks would tend to have little significance if all samples yielded relatively high concentrations. On the other hand, if concentrations of samples and method blanks were comparable, little or no contamination may exist at the site.

The data will also be reviewed by the laboratory section manager for appropriate and acceptable quality control results. When the data are deemed to be acceptable, they will be submitted to the LQAC for the final audit.

The LQAC will review the data for compliance with THAMA guidelines. When the data are considered to be in consonance with THAMA requirements, the QAC will submit the data to the laboratory data technician for correlation with the sample log information which has been previously entered. Simultaneously, a copy of the cover sheet accompanying this data will be sent to the TDM for describing and tracking the data. The analyst will then enter the data into the laboratory information management system thus completing the information required prior to transmission to THAMA.

Once the analytical data has been entered for a lot, the information is then transferred from the laboratory via transfer files to the PC-based IRDMIS for record, group, and other verification. GC/MS library search compounds will be coded for entry into IRDMIS as follows:

- For compounds whose chemical name can be determined with 95% or greater accuracy, that chemical name will be reported.

- All other compounds will be entered as unknowns (UNK), and their relative retention times will also be entered. Hard copies of the three "best fit" chemical names (mass spectral) will be transmitted to the THAMA chemistry group.

The subcontractor laboratories performing chemical analyses will enter their data directly into IRDMIS. The subcontractor laboratories performing radiological analyses and air analyses will transmit their data to WESTON in a previously agreed upon format. The WESTON data management group will then enter the data into IRDMIS. This data will be verified as described above. Once the data has been verified (and corrected, if necessary), it is ready for transmission to THAMA. Data will them be transmitted to THAMA electronically, or it will be transmitted on a floppy diskette. WESTON will transmit the data from the Eberline and Coast to Coast laboratories, as well as from its own laboratory. Arthur D. Little will be responsible for the transmission of its data. All transmittals will include a cover letter to the Project Officer. The transmittal of this data will serve to initiate the data tracking system at WESTON.

SECTION V5

IRDMIS

The IRDMIS is composed of two components; the PC-based data entry and validation system and the UNISYS-based reporting system. WESTON routinely uses the reporting system to generate various chemical reports and maps. Regarding the input of data to the IRDMIS, WESTON uses the PC-based IRDMIS for geotechnical data and a combination of the WESTON Laboratory Information Management System (LIMS) and the PC-based IRDMIS for sampling and analytical data. WESTON has modified its LIMS to accept sampling and analytical data and to produce data records that are compatible with the PC IRDMIS. Complete information for analytical lots are typically transferred to the PC as soon as analysis results are available and entered into the LIMS. Data flow with IRDMIS is graphically summarized in Figure V-1.

Each analytical lot is then subjected to the record check routine of the IRDMIS to look for entry errors associated with incorrect analytes, certification, holding times, and similar information. Entry errors will be corrected using the edit function of the program. When the analytical lot is found to be clean by the record check routine, the lot will be subjected to the group check routine to detect errors in the site data such as IDs, number of QC samples, and QC spiking levels. Any errors (technical as well as format) in Level 1 will be corrected prior to transmitting the data to UNISYS at Edgewood. When the data have successfully passed the group check routine, the data will be converted to a transfer file for transmission.

Weekly transmission of data to UNISYS at Edgewood is anticipated. Diskettes containing transfer files will be mailed to THAMA on a weekly basis. Hard copies of the transfer files will accompany the diskette and copies of the diskette and the transfer file print out will be maintained by the contractor. Data will be transmitted to UNISYS computer, processed through the verification error routine, and passed on to Level 2. All files in Levels 2 and 3 will be the responsibility of the federal government.

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FIGURE V-1

DATA FLOW WITH IRDMIS